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MR. PRESIDENT, FELLOWS, AND GENTLEMEN,—In the first two lectures I referred to those factors which brought about an increased output of calcium and phosphorus from the bones. I shall now speak of certain conditions associated with defective absorption and utilisation of calcium and phosphorus which give rise to diseases of bone. I shall also discuss the storage of lead in the bones in chronic lead poisoning, and I shall conclude by stating briefly the contributions to therapeutics of the researches I have quoted.

IRRADIATED ERGOSTEROL.

Studies of calcium absorption and utilisation are necessarily more difficult than those of endogenous calcium metabolism. It is not surprising, therefore, that the voluminous literature on the subject of irradiated ergosterol throws little light upon its mode of action. Various workers [91 92] have reported hypercalcæmia arising from its use. But the level of the serum calcium indicates only the height of the "calcium stream" and gives no indication of its direction of flow. This can be determined only by studies of the total calcium metabolism.

The effect of irradiated ergosterol on the storage of calcium in animals has been studied by Bauer and Marble.[93] They placed 12 cats on a low calcium diet for some months, previous experiments having shown that such treatment causes a marked diminution of bone trabeculæ. At the end of this period, the left forelegs of all the cats were amputated at the shoulder-joint. All 12 cats were then placed on a high calcium diet, 6 of the 12 being given irradiated ergosterol in addition. After some time the cats were killed, and in each case the right humerus was prepared for comparison with the left. The cats receiving irradiated ergosterol showed a much greater increase in the number of trabeculæ in the right humerus than did the controls.

It therefore seems likely that irradiated ergosterol increases the amount of calcium which is absorbed from the gastro-intestinal tract, and that if this increased absorption occurs at a time when the body needs calcium, an increased deposition of calcium occurs in the bones. Complete metabolism studies on human subjects [93] show that there is an increase in calcium absorption when irradiated ergosterol is administered. These findings corroborate those obtained with cats and explain why the use of irradiated ergosterol in the treatment of rickets and osteomalacia has met with such uniformly beneficial results.

Effects of Over-dosage by Irradiated Ergosterol.

Considerable interest has recently centred on the effects produced by the administration of excessive doses of irradiated ergosterol. Pfannenstiel [94] found that such doses resulted in the death of young rabbits. Kreitmair and Moll [95] extended this work and found that mice, rats, cats, rabbits, dogs, and guinea-pigs died in periods ranging from 15 to 40 days with doses varying from 1 to 40 mg. daily. In all cases the animals lost weight profoundly, and post-mortem examination showed deposits of calcium salts in the arteries, lungs, kidneys, stomach, and intercostal muscles. Kreitmair and Hintzelmann [96] have since confirmed this, and they have added the important observation that, when the experiments are of long duration, there is a decalcification of the bones which especially affects the ribs but also involves the extremities, spine, and calvaria. This mobilisation of calcium from the bones in "hypervitaminosis D" has been confirmed,[97] and György [98] has recorded experiments which seem to show that the spongiosa of bone is called upon first. In these experiments growing rats on a diet not very rich in calcium were treated with large doses of irradiated ergosterol. Hypercalcæmia occurred, and they lost appetite, weight, and hair. Post-mortem examination revealed macroscopic areas of calcification in the aorta and stones in the bladder. Controlled radiograms of the bones showed localised osteoporosis of the subepiphyseal spongiosa.

The Method of Irradiation of Ergosterol.

The work of Dixon and Hoyle [99] has shown that the pathological changes produced in such experiments on animals depend largely upon the manner in which the ergosterol is irradiated. In the case of material irradiated in oily solution—analogous to the natural irradiation of the ergosterol of the skin by sunlight—no abnormal effects upon the weight curve and no post-mortem lesions were found in rats after the daily administration of doses up to 2 mg. for 45 days. Much larger doses administered daily for a corresponding period led to interference with growth and the formation of calcium phosphate calculi in the urinary tract. Calcium deposits in the kidneys, arteries, and other tissues were not present in these animals. The possible significance of these observations is not without interest in the ætiology of tropical urolithiasis.

The pathological effects produced in animals by administering similar doses of ergosterol irradiated in alcoholic solution are very much more severe than those described for material irradiated in oil. They consist essentially of intense marasmus and widespread calcification of the arterial system, myocardium, and kidney. Urinary calculi occur only rarely. Hoyle [100] has shown that the diet given in such experiments is a determining factor in the production of this pathological picture. All the lesions occur constantly in rats when a synthetic diet is being taken together with a daily dose of about 80,000 antirachitic units of irradiated ergosterol, and death is usual within two or three weeks. If a natural diet of bread and milk is given, together with these excessive amounts of ergosterol irradiated in alcohol, the animals remain well, except for some retardation of growth. After 30 or 40 days, post-mortem examination in such animals shows urinary calculi in some cases but no calcium deposits in any of the organs. These latter effects are identical with those produced by giving similar doses of ergosterol irradiated in oil, together with a synthetic diet. In other words, the effect of a natural diet is to deprive ergosterol irradiated in alcoholic solution of certain toxic properties. This is strong evidence against the view that vitamin D and the toxic factor responsible for the marasmus and calcification of tissues are identical, and it shows that "hypervitaminosis," as distinct from the toxic action, is not an entirely new type of toxæmia but only the exaggeration of a physiological action.

In recent work, Hoyle [101] has extended these observations and has found that neither milk nor bread alone, when given with a synthetic diet, has any protective action. Further, a synthetic diet modified to resemble bread and milk as regards its carbohydrate, fat and ash content does not prevent the toxic action of ergosterol irradiated in alcoholic

solution. If the amount of the latter in a diet be increased still more, to such doses as 200,000 units daily, then bread and milk loses its protective effect. These results suggest that some previously unrecognised factor in diet is concerned in the protective action.

RICKETS AND OSTEOMALACIA.

Morbid anatomists are agreed that in rickets and osteomalacia the essential abnormality is the same—namely, a deficient calcification of osteoid tissue. This deficiency is generalised throughout the skeleton. In rickets, since endochondral ossification has not ceased, the zone of provisional calcification is affected too, and endochondral ossification is irregular.

The nature of the calcium deficiency has given rise to much controversy. Virchow [102] held the view that calcium salts had been removed from calcified bone leaving osteoid tissue. This was the doctrine of "halisteresis," which means literally "salt deprivation." Pommer [103] and Schmorl,[104] while expressing the view that osteomalacia and rickets are essentially the same disease, held in addition that halisteresis is not responsible for the broad osteoid zones. They considered that, in both diseases, the calcifying mechanism which should convert osteoid tissue into true bone was deficient. Not only does any bone added by advancing endochondral ossification remain osteoid, but so also does all new bone added to trabeculæ which were fully calcified at the onset of the disease. The normal physiological resorption accompanies this apposition, and consequently portions previously hard become ever softer and more liable to bend.

Now, although there are many problems still unsolved concerning the ætiology of these two diseases, it is clear that the calcifying substance which is missing is vitamin D. In its absence the utilisation of calcium and phosphorus is impaired. Studies of the blood chemistry in children with rickets show that the essential abnormality is a low inorganic phosphorus content. The serum calcium is usually normal, but in a small proportion of cases it is reduced. In such cases tetany may occur. In osteomalacia a low serum calcium is the rule and tetany is very common.

In both diseases the abnormalities in the blood are promptly restored to normal by the use of cod-liver oil, ultra-violet light, or irradiated ergosterol. At the same time ossification begins to proceed normally. Biochemistry has therefore amply justified the view held by Pommer and Schmorl as to the pathogenesis of these diseases and as to their essential identity.

Clinical Features of Osteomalacia.

Osteomalacia is a deficiency disease endemic over wide areas in Northern India,[105] Japan, and Northern China,[106] and occurring sporadically in the Rhine Valley, Danube Valley, Vienna, and certain parts of Italy, Switzerland, Flanders, and the Balkans. It is a rare disease in the British Isles and U.S.A. It pre-eminently affects women, and is likely to recur earlier and with greater severity in each successive pregnancy. Many cases clear up after lactation is complete, or even before this time. However, it is a mistake to suppose that pregnancy is essential in its ætiology; it is sometimes seen at puberty, and is quite well known to occur, though it is rare, in boys and men. Maxwell [106] states that it is known to the Chinese as "Yao t'ui t'eng"—"back and thigh pain." The pain is aching in character and is worse in the winter months. The pelvis, thorax, or long bones show deformity in a haphazard way; one woman suffers in the pelvis, another in the ribs, and a third in both. Besides the characteristic and well-known changes in the pelvis, marked deformities occur in the chest and spine. Severe kypho-scoliosis may reduce the height by several inches and cause the head and neck to sink downwards and forwards on to the chest. Deformities of the sternum and ribs may give rise to marked prominences and depressions in the chest wall. Coxa vara and irregular curves in the long bones are less common. The bones are soft and flexible rather than fragile, so that bending is much more common than spontaneous fracture, though both are well recognised. The patient develops a characteristic waddling gait, and muscular weakness may add to her incapacity. Tetany is very common, and the attacks may last for hours. In many cases the pelvic deformities interfere with marital relations or with pregnancy, Cæsarean section frequently being necessary.

Pathogenesis of Osteomalacia.

It is only in the past seven years that real progress has been made towards solving the problem of the ætiology of osteomalacia. For almost half a century the hypothesis was held that the disease was due to a pathological increase in the activity of the ovaries leading to hyperæmia of the bones and a consequent solution of their lime salts. This was not based on accurate experiment, neither was there any evidence worth the name that the ovaries were histologically abnormal. The hypothesis arose in 1879 when Fochier [108] performed Cæsarean hysterectomy in several cases of osteomalacia and found that a good effect was produced on the progress of the disease. Fehling [109] then set the fashion by performing ovariotomy for osteomalacia quite apart from pregnancy, and within a few years this treatment was performed all over the world. Now, while there can be no doubt that pregnancy leads to the development of osteomalacia, there is very little evidence that the ovaries exert any effect on the disease apart from their rôle in pregnancy. It is true that Mirvish and Bosman [110] have shown that the injection of ovarian extracts into normal human subjects causes a reduction in serum calcium. On the other hand, the experiments of Korenchevsky [111] failed to show after castration any chemical or histological changes in the skeletons of growing rats fed on a normal diet. Castration presumably acts by stopping the possibility of further pregnancy and lactation with their consequent drain on skeletal calcium, and this can be as easily done by ligature of the Fallopian tubes.

An amazing fallacy regarding the ætiology of osteomalacia originated in the work of Bossi,[112] who arrived at a method for treating the disease with adrenalin by the following argument: "Since suprarenal substance is known through its pressor action to modify deeply the circulation of both sexual organs and bone marrow, since removal of the suprarenal has been shown in animals to cause deep and lasting changes in the ovary, I thought of treating this case with suprarenal substance (adrenalin)." After claiming, on quite inadequate evidence, that the patient was cured by the injections, he proceeded to an experiment upon a sheep in the middle of pregnancy. He removed one suprarenal and the animal remained well until the seventh day, when it had difficulty in walking. On the eighth day it could neither stand nor walk, and it showed "curvatures of the joints in the whole body, the hips markedly rotated inwards, and painful on pressure." Such is the evidence on which the suprarenal origin of osteomalacia is based. One asks oneself whether its exponents of to-day have troubled to read the article from which it sprang!

Studies in the mineral metabolism of osteomalacia date back many years, and began with analyses of the bones. McCrudden [113] in a case of adolescent osteomalacia found 15·4 per cent. CaO in dried bone as compared to 28·8 per cent. in normal bone. In 1910 the same observer demonstrated a negative calcium balance in eight cases of osteomalacia.

The blood chemistry had not been studied accurately until Miles and Feng [114] investigated ten patients in May, 1923. These cases varied in duration from 8 months to 20 years; in 7 there was tetany, and in all a considerable diminution in the serum calcium (5·0 to 7·4 mg. per 100 c.cm.). The plasma phosphorus varied from 1·8 to 3·8 mg. per 100 c.cm. The same workers carried out calcium

balance experiments on four adult females taking a low calcium diet consisting of millet gruel, wheat bread rolls, celery-cabbage, garlic, and dry steamed millet. A negative calcium balance was found in three patients, positive in one. Keeping the diet identical and adding cod-liver oil, alone or in combination with either calcium lactate or calcium phosphate, they were able to bring about marked retention. In one patient receiving olive oil with calcium lactate, the calcium balance remained negative. Osteomalacia therefore chemically resembles low calcium rickets. In the present state of our knowledge the occurrence of hyperplasia of the parathyroids in osteomalacia [64 65] is without explanation. Since all the parathyroids are usually affected, the hypothesis that the change is compensatory seems attractive.

Economic Factors Responsible for Osteomalacia.

With the story of rickets before us we can trace the economic factors operating in the causation of osteomalacia. They are factors difficult for a Western civilisation to appreciate, deep-rooted as they are in the social and religious customs of the East. The diet of the Chinese people is meagre, consisting, as in the experimental diet used by Miles and Feng, entirely of cereals and a limited amount of vegetables with no milk, meat, or eggs. It is deficient in vitamin D and in calcium salts, and contains an excess of acid-forming over base-forming mineral elements. The environment tends to keep the woman patient isolated from the sun, for foot binding retards movement, and the severe winters of the high plateau lands of North China lead to confinement indoors. When the pains of osteomalacia begin she retires to her warm brick bed thereby completely shutting herself off from the sun. In India the areas affected are in the North, in the high valleys where sunlight is scanty in winter owing to the surrounding mountains. As in China there is a marked seasonal incidence, the disease being worse in winter and early spring. The women affected are those observing strict purdah.[115] They are systematically screened from the sun from the age of ten. They eat no raw vegetable or fruit, largely from fear of cholera. The pregnant woman is kept short of food with the idea of keeping the fœtus small for an easy labour. The calcium drain of lactation is very severe, for it commonly goes on as long as four years. Under such social systems it is not surprising that other deficiency diseases may exist together with osteomalacia. Thus Wampler [116] reports œdema in one-third of 46 cases, and xerophthalmia in one.

In the treatment of osteomalacia, as in the case of rickets, cod-liver oil, sunlight, and irradiated ergosterol, each has its place. Vaughan [118] reports that "out-patients given cod-liver oil and ordered to go out on the lake in open boats improved rapidly." Starlinger [117] and Hottinger [118] report cures with irradiated ergosterol, and it is an interesting fact that each of their cases had been previously treated unsuccessfully by ovariotomy. Maxwell [106] states that "given cod-liver oil, good food and sunlight, the majority of the patients will slowly recover. Cod-liver oil and calcium salts quickly remove tetany and the worst of the pain." He finds that some cases require an ounce and a half of cod-liver oil with one milligramme of irradiated ergosterol daily. But he adds, "we want flocks and herds, milk and meat, with security of life and property."

Antenatal Rickets.

In the days of Virchow, several diseases of bone discoverable in the new-born were classed together as "fœtal rickets." These have since been identified as achondroplasia, osteogenesis imperfecta, and cretinism. Maxwell [106] claims to have found true rickets in antenatal life. He took radiograms of the bones of the new-born babies of osteomalacic mothers, and demonstrated the typical changes of rickets in the metaphyses. Microscopic preparations of the bones were obtained from one case. In these, Turnbull [107] found changes attributable to a mixture of rickets or osteomalacia, with Barlow's disease. It is of some importance, too, that babies of osteomalacic mothers do get post-natal rickets, and that in China rickets is especially severe where osteomalacia is more common.

Hunger Osteopathy.

Occasional cases of hunger osteopathy were known [119] before 1914, but the mass experiment of war caused large numbers of cases to appear in Austria, Germany, and Poland between 1917 and 1919. Concurrently rickets,[120] late rickets, osteomalacia,[121] and Paget's disease,[122] increased in incidence and severity. The people of industrial towns were most affected. Thus in Frankfort the food was principally potatoes, watery soups, and dried carrots. Fresh vegetables were rarely obtainable. Meat, fish, and bread were rationed. Fat, butter, cheese, eggs, milk, and rice were completely absent. Hence the diet was deficient not only in total calories, protein, and fat, but also in calcium, phosphorus, and vitamins.

Clinically, the condition resembled early and slowly progressing osteomalacia. In age and sex incidence it was most peculiar. The majority of patients were elderly, and of either sex. Adolescents between 14 and 20 years were also attacked, and in this age-period two to four times as many males were affected as females. Children from 6 to 14 years were absolutely spared, and people from 20 to 35 years were almost wholly immune. The poorest were most affected. They looked prematurely aged, with sunken orbits and a sallow colour. Pain in the tarsus and metatarsus gave rise to difficulty in walking. Later there was pain in the sacrum and ribs, with a characteristic waddling gait and difficulty in mounting steps. The pains were always associated with movement. Many patients complained of cramp in feet, legs, or forearms. Tetany was not infrequent, and some cases showed positive Erb, Trousseau,[120] and Chvostek signs.[123] There was tenderness of the bones, so that compression of the ribs and sacrum and abduction of the thigh caused pain. A few patients gave a definite history of decrease in height. Spontaneous fractures were sometimes seen,[124] and occasionally deformities of ribs, sternum, and spine.[119 123]

Dalyell and Chick [120] found a marked remission in the disease in Vienna in the late summer of 1919. In December, 1919, they found fresh and recurrent cases in two convents in which the nuns had suffered severely during the previous winter. Between January and May, 1920, they treated 600 out-patients with the disease. For obvious reasons no investigations of the blood chemistry could be made. Cod-liver oil was found to be a specific. After a few days movements of the trunk became less painful, so that the patient could stoop or turn readily. The gait often improved within a week. During the second week there was less pain on abduction of the hip, but pain caused by compression of the ribs continued longer. The most obstinate pains were the lumbo-sacral and tarsal, which sometimes persisted for six weeks after the commencement of treatment. In cases with tetany this improved before the other symptoms and signs. From what we now know of vitamin D, the remission of symptoms in summer and their relapse in winter was a question of the amount of sunlight; and from accounts of the disease it is evident that no therapeutic measure was successful unless it included vitamin D. Post-mortem material was only obtained where deaths occurred from intercurrent disease. There has been much controversy as to whether the condition was true osteomalacia, and this, of course, can only be settled by the expert histologist.

Schmorl [125] and Partsch,[119] working in Dresden, regard the condition as true osteomalacia showing an extreme degree of osteoporosis. They comment upon the rarefaction of the corticalis; in one case "the compacta of the femur was nowhere more than 3 mm. thick." In the vertebræ the corticalis was

almost as thin as paper, and the spongiosa could be crushed with the finger. The histological picture showed the spicules of the spongiosa much reduced in number and in thickness, and composed of narrow cores of bone covered by broad seams of osteoid tissue.

Goldschmid,[126] working in Frankfort, states that "purely porotic changes predominate in the bones, though there are quite isolated cases where thin spicules covered with narrow osteoid seams are found in the spongiosa—that is a combination of porosis with malacia." The student of mineral metabolism would predict such disagreement between histologists since so many factors, varying in different localities, came into play. These variables were degree and length of starvation, amount of calcium, phosphorus, and vitamin D in the diet, and exposure to sunlight. It is interesting that Schmorl [125] should have found enlargement of the parathyroids in a man of 73 who had suffered from hunger osteomalacia with pains in the bones for three months. He states that "there was a very great enlargement of the parathyroids, the two upper ones being the size of a cherry stone, and one lower one the size of a pea. The fourth was not found."

Styfsiekte, or Stiff-Sickness of Cattle.

Styfsiekte, or "stiff-sickness," is a phosphorus deficiency disease of South African cattle. The problem of its ætiology has been solved by the extensive investigations of Sir Arnold Theiler.[127] The disease also occurs in Minnesota,[128] and is probably identical with the "Grand Traverse Disease" of Michigan, "Impaction Paralysis" and the "Cripples" of Australia, and "Midland Disease" of Tasmania.[129] The animals most affected are heifers with a first calf, cows in lactation, and growing cattle. They may develop an intense craving for bones, a symptom which is termed osteophagia. This compels them to travel long distances to find carcasses to eat, and they may even kill and eat young lambs. On the veld they may sometimes be seen and heard in the distance crunching bones. The disease shows itself in retardation of growth and abnormal skeletal development, the most obvious features of which are the thickening of the epiphyses of the leg bones, most pronounced at the metacarpus and first phalangeal joints. The gait is stiff and lame. In the young lactating animal there is usually rapid loss of condition, the lameness may become acute, and the animal tends to walk on its heels, with hoofs growing out. The bones may become fragile, and fracture of the ribs and pelvis has been observed. The posture becomes abnormal, sometimes with curved spine, and in the last stages the stiffness and lameness become so painful that the animal is unable to rise, so that death from cachexia ensues. In the affected areas the soil and grass are deficient in phosphorus, so that hay may contain less than one-fifth the normal amount of phosphorus. The blood chemistry has been investigated in the Minnesota cases.[128] There the low phosphorus intake gives rise to a low inorganic phosphorus content of the plasma, which is often less than 2 mg. per 100 c.cm. There is no defect, however, in the calcium content of the fodder, and the serum calcium of affected cattle is normal or even raised (12·1 to 14·6 mg. per 100 c.cm.). The bones are fragile and easily cut with a knife, and the skeleton is light.

Theiler, Green, and du Toit [127] have reproduced experimentally "aphosphorosis," or clinically recognisable phosphorus deficiency disease, and have shown it to be identical with the naturally occurring South African disease Styfsiekte. The animals were heifers varying in age from 12 to 18 months. All of them received exercise each day in brilliant sunshine. The disease picture was produced in all animals where low-phosphorus rations were given, whether the calcium content of such rations was high or low. The inorganic phosphorus of the blood sometimes dropped to 1·3 mg. per 100 c.cm., even before the disease could be diagnosed clinically; the blood calcium was normal. Vitamin deficiency of the diets had no adverse effect.

Of the affected animals dying or killed some showed brittle, fragile, or fractured ribs, the whole of the skeleton being too light. Sir Arnold Theiler is at present working on the histology of experimental aphosphorosis, and he states [130] that "the sections reveal the presence of osteomalacia and rickets in some cases in a most extraordinary degree." Although his work is not yet published, he was kind enough to lend me stained sections of bones from his experimental material together with controls. Prof. Turnbull studied these sections, and he agrees that the abnormalities are typical of rickets, or of osteomalacia in bones in which endochondral ossification has not ceased.

Styfsiekte is therefore rickets or osteomalacia of the "low phosphorus" type, produced by a mass experiment of Nature in areas where the soil and grass are deficient in phosphorus. Sunlight is apparently unable to prevent its occurrence. As further evidence that the condition is one of pure phosphorus deficiency, the South African workers found that the disease can be prevented by supplementing the grazing of the areas in which it is prevalent with bran, which is a food of high phosphorus, low calcium content. Similarly, the Minnesota workers, by a supplementary ration of 100 g. daily of NaH_2PO_4, were able to raise the plasma phosphorus to 5·5 mg. per 100 c.cm. with complete clinical cure.

The routine preventive is bone meal. The ration required varies from half a pound to two pounds per head per week, according to conditions of growth and lactation. This simple measure abolishes osteophagia and Styfsiekte, and leads to an increase of the milk yield of cows, better calves at birth, more rapid growth of young stock, and superior fattening of adult cattle. Could agriculture ask more of the scientific investigator?

LATE RICKETS.

Late rickets is found in the later years of childhood in places where rickets is common. It is also found where osteomalacia is endemic. Its pathogenesis, blood chemistry, and histology enable us to class it definitely with rickets and osteomalacia. With a knowledge of vitamin D, and especially of the newer methods of blood chemistry, two conditions associated with bone deformities have been differentiated from late rickets—namely, cœliac rickets and renal rickets. It should be clearly understood that cases of cœliac disease and renal infantilism only occasionally show rickets; in fact, cœliac rickets is quite rare in cœliac disease.

Although these two conditions show clinical pictures quite different from rickets, the actual bone changes may be identical with that disease. For example, in a case of renal rickets examined by Prof. Turnbull, histological sections of the bones were in all respects characteristic of rickets. This point is of paramount interest in the study of calcium and phosphorus metabolism, for in renal rickets vitamin D is not lacking, and the bone changes are due to a disturbance of endogenous and not of exogenous metabolism.

Cœliac Rickets.

Cœliac infantilism may be defined as the arrest of development which occurs in that form of severe chronic intestinal indigestion described by Gee,[131] and explained on the basis of defective fat absorption. In 1913, Parsons [132] pointed out that bone deformities, especially genu valgum, not uncommonly complicate cœliac disease, and in 1927 he investigated the blood chemistry in five such cases. The serum calcium was constantly low, and the plasma phosphorus occasionally low. Tetany was commonly present. In cases of moderate severity, the radiographic appearances of the bones were striking. There was delay in the centres of ossification, osteoporosis, and a well-marked metaphysis. Except that it was not so much splayed out, the metaphysis did not differ from that found in ordinary rickets. Single or multiple, complete or incomplete, fractures of the shaft were frequently observed.

McCrudden and Fales [133] related osteoporosis and fractures to the negative calcium balance which they found in the disease. Lehndorff and Mautner [134] pointed out that a child with cœliac disease is liable to spontaneous fractures. I can find no record of histological examination of such bones. Cœliac rickets can be completely cured, even when the patient is on a fat-free diet, by ultra-violet light or irradiated ergosterol.[132] It is, therefore, fair to say, even in the absence of histological records, that the combined evidence strongly favours a rachitic origin of the bony changes sometimes found in cœliac disease.

Idiopathic Steatorrhœas of Adults.

Since the description by Herter [135] of intestinal infantilism, later authors have paid attention only to cases of steatorrhœa in children, and have forgotten that Gee also observed the condition in patients returning from India and in adults who had never been abroad. The occurrence of tetany is not uncommon in tropical sprue. It is associated with a low serum calcium, and is no doubt related to deficient calcium absorption. However, it has been found [136] that severe and cachectic cases of sprue often have a normal serum calcium. The cause of sprue is unknown, and whatever calcium defect may be found is of secondary importance only.

Cases in adults of fatty diarrhœa with tetany, accompanied by extreme wasting, occur sporadically in temperate regions. Of these it is equally true that the cause of the defective absorption of fat is unknown, and that the defect of calcium absorption is of secondary importance only. Thaysen [137] regards them as cases of non-tropical sprue, and includes them with sprue and with cœliac disease in the term "idiopathic steatorrhœas." Cases have been recorded of patients who had cœliac disease in childhood and recurring diarrhœa and tetany in adult life.

The fat in the stools is mostly split fat. There is pallor and sometimes severe anæmia.[138] In three cases I have found clubbing of the fingers. The abdomen is distended, and the colon may be dilated. Bone deformities are common and include genu valgum, genu varum, bowing of femora and tibiæ, and spontaneous fractures. I have seen one case where osteotomy of each femur had been performed. Achlorhydria is common, and the blood-sugar tolerance curve may be low.[137] The plasma phosphorus is greatly reduced, and the serum calcium may be low. Metabolism studies [139] suggest that the chief factor concerned in the calcium defect is a failure to absorb vitamin D, and that the formation of calcium soaps is not an important factor in preventing calcium absorption. Treatment by fat restriction and irradiated ergosterol is sometimes effective.

CASE 8. *Idiopathic steatorrhœa with tetany and dwarfism.*—A single woman of 34 years (L.H., Reg. No. 40440, 1928). Clinical history: She was born at full-term and was the first of four children. She was breast-fed for 12 months, and afterwards took badly to milk. At five months she cut her first tooth, and at ten months she talked. At 13 months she began to walk, when it was noticed for the first time that her knees were wrong. She was a small child. The first and second dentitions were apparently normal. At five years she began to go to school, but could never run because of her knees. She had occasional short attacks of diarrhœa.

As a child she was usually top of her class in school. As she approached the age of 14 she became weak and stopped growing, and she had vague symptoms of what she afterwards learned was tetany. One morning in March in the year she was 14, she awoke with her hands stiff and with pains in wrists, ankles, and knees. Characteristic carpopedal spasm occurred. Her hair began to get thinner and became greyish. There was no change in the skin or nails. Nine months later menstruation began. Subsequent periods have been normal in amount and somewhat irregular, with intervals of five or six weeks.

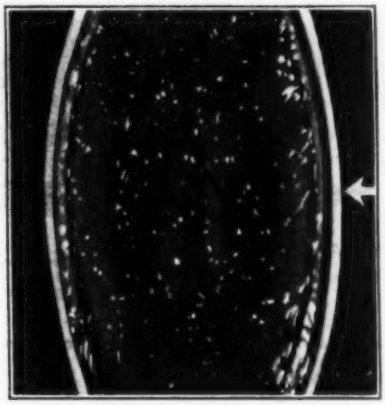
Between the ages of 16 and 24 she was semi-invalid and had to be wheeled about in a bath chair. She then improved for a time, taking an interest in people and in books, but having to rest for a period every day. Attacks of tetany occurred about four or five times every winter and, later, sometimes in the summer. They had no relation to menstruation. Early attacks were confined to the hands and feet; later ones affected also the shoulders, knees, neck, and face. Sometimes she was unable to speak for short intervals, breathing was difficult, and the eyelids twitched. Pain and spasms lasted up to two or three hours. Subsequently the muscles felt stiff and aching and remained so for three or four days.

At the age of 28 she began to have attacks of epigastric discomfort with abdominal distension, flatulence, and diarrhœa. There was complete loss of appetite (she had never been able to take milk or bacon fat). The diarrhœa often lasted several weeks. Sometimes attacks of tetany were associated with these disturbances, though there was no constant time relation between the two.

Family history: Father, mother, one sister, and two brothers alive and well. There is no history of dwarfism in the family.

Clinical examination: She is a tiny woman, thin, with the general contours of an adult, except that her head is rather large in proportion. She is mentally normal, and unusually intelligent, but she has the shyness and sensitiveness of a dwarf. Her brow is wrinkled, and her expression anxious and a little pathetic. Height 4ft. 3in. Weight 5 st. 2 lb. Voice, high and piping. Skin: pale, fine, and smooth; face freckled. Hair: thin and very fine on the head, brown and in places grey; normal on the pubes; very scanty in the axillæ. Teeth: double dentures; a few remaining molars. Eyes: Slit-lamp examination of lenses (Fig. 14). Collections of opacities in the lens similar to those seen in a case of post-operative tetany. There are central flaky opacities with some small crystalline opacities, some chromatic. Powdery opacities are seen in the nucleus of the lens. (Mr. C. B. Goulden.) Thyroid gland: present and normal in size. Hands: small and delicate in proportion to the rest of the body, resembling those of a child of 14. Trousseau sign positive. Chvostek sign never elicited. Knees: marked genu valgum, more pronounced on the right side, and so severe that she can stand only with her legs crossed, the right in front of the left. When the knees are placed together side by side, the feet are separated by eight inches. Spine: straight. Breasts: normally developed. Heart and lungs normal. Pulse regular, 82. Radial arteries normal. Blood pressure 145/90. Abdomen: rather protuberant, especially above the umbilicus.

FIG. 14.



Idiopathic steatorrhœa with tetany and dwarfism (Case 8). Opacities in the lens, as seen with the slit-lamp. (*From drawing by Theodore Hamblin Ltd.*)

Special examinations.—Urine normal. Urinary diastase index, 5. Renal efficiency tests: blood-urea 0·028 per cent. Phenolsulphonephthalein excretion, 25 per cent., 12·5 per cent., 10 per cent., in successive hours. Urea concentration up to 3·36 per cent. Blood: red cells 4,600,000 per c.mm. Hæmoglobin 62 per cent. Colour-index 0·67. White cells 6320 per c.mm. Polymorphonuclear neutrophils, 58 per cent; eosinophils, 0·5 per cent.; small lymphocytes, 26·5 per cent.; large lymphocytes, 3·5 per cent.; large hyaline cells, 11·5 per cent. Serum calcium: 8·2 mg. per 100 c.cm. Plasma inorganic phosphorus: 2·4 mg. per 100 c.cm. Fractional test-meal: achlorhydria. Fæces: pale and porridgy; three separate determinations of their fat content gave the following results:—

	Per cent.	Per cent.	Per cent.
Total fat	60	51	65
Unsoaped fat	57	26	38

Radiograms of bones: There was a uniform diminution of density of X ray shadows of bones (Fig. 15) contrasted with those of a control subject of the same age, sex and build exposed simultaneously on the same negative. The epiphyses were united. The metaphyses of many of the long bones showed faint transverse "lines of cessation of growth" up to five in number.

The serum calcium curve.—The variations in serum calcium throughout the 13 months she was under observation are shown in Fig. 16. In March and April, 1928, it lay between 6 and 8 mg. per 100 c.cm. Then, during the three weeks when irradiated ergosterol was being given, with a daily intake of about 0·5 g. calcium, it rose steadily to 10·8 mg. After the irradiated ergosterol was discontinued it declined gradually, and in mid-June fell as low as 7·2 mg. In July and early August, under the influence of a high calcium diet and large doses of calcium lactate, it climbed steadily from 8·7 mg. to a maximum of 12·1 mg., and throughout August, when irradiated ergosterol was superadded, it remained between 11 and 12 mg. In September when the calcium intake was reduced to less than 1 g. a day, and a severe attack of intestinal discomfort with diarrhœa was in progress, it fell again, fairly rapidly, to 8·6 mg. During the winter a very slow and somewhat irregular decline continued, till on March 25th, 1929, the very low level of 5·0 mg. was reached. For most of this time up to Feb. 21st the calcium intake was below 0·6 g. daily, and the fat content of the diet was minimal. During March, when the calcium intake had been raised to 1·8 g. daily and the diet was also rich in fat, the decline continued. In April the intake was about 1 g. a day, and ultra-violet light treatment was begun. The result was a prompt rise in serum calcium level from 5·7 to 8·6 mg. in three weeks.

The observations thus show clearly that a definite rise in the serum calcium level could be produced by any one of three agencies, namely: (1) irradiated ergosterol (with low calcium intake); (2) high calcium diet with superadded large doses of calcium lactate; (3) ultra-violet irradiation.

The tetany.—Trousseau sign was present when she was admitted, and remained present throughout the rise of the serum calcium curve to 10·8 mg. in response to irradiated ergosterol. In the second, more marked, and better sustained rise, produced by high calcium intake and irradiated ergosterol, the sign disappeared when the curve reached 10 mg. and did not appear till it declined sharply 2½ months later to 8·6 mg. Even then it was not elicited in October when the serum calcium was 8·5 mg., but it reappeared in November and remained continuously present, except for two occasions in January, until the following April. Then following five days' exposure to ultra-violet light it promptly disappeared, while the serum calcium still remained at 6·8 and 6 mg., and was not again elicited before the patient's final discharge.

These observations show that there is a general relationship between the liability to tetany as tested by the Trousseau sign and the serum calcium level, in that the sign is present when the calcium is low and tends to disappear when it rises, but the relation is not a fixed or constant one. The disappearance of the sign after irradiation, before the serum calcium had risen above 6 mg., is very striking, and it may be significant that the period of absence of the sign during the time of high calcium intake and high serum calcium level (July and August) occurred at the height of the summer, when the patient was receiving a certain amount of sunshine.

FIG. 15.

Case 8.—Controlled radiogram showing diminished density of X ray shadows of bones in idiopathic steatorrhœa.
The negative has been cut down and the two portions placed together for close comparison.

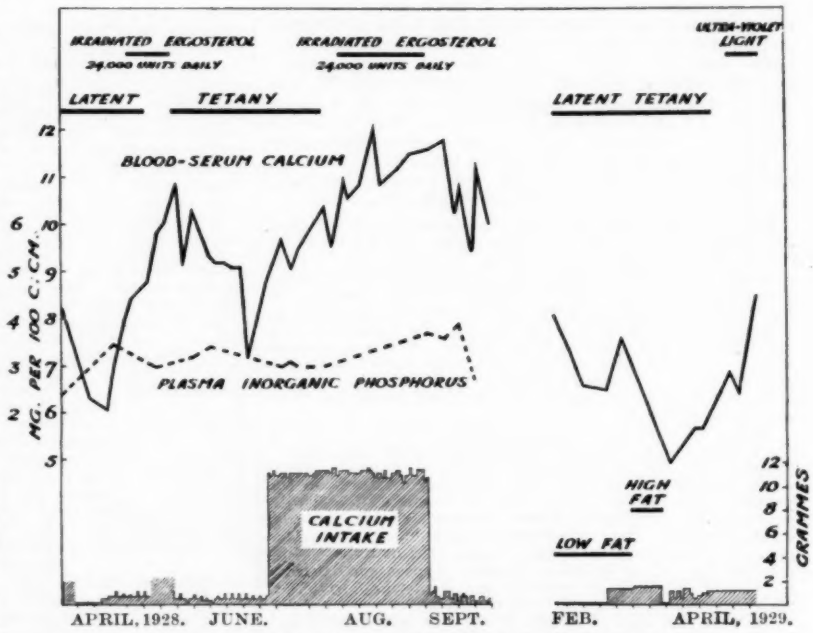
TABLE III.—*Chemistry of the Blood in a Case of Renal Rickets.*

Date.	Serum Ca.	Plasma P.	Plasma phosphatase.	Blood-urea.
Aug. 21 ..	7·4	3·5	—	0·090
Nov. 9 ..	7·9	—	—	0·111
Dec. 30 ..	6·8	5·0	1·03	0·141
Jan. 14 ..	7·1	5·0	—	0·174
Feb. 4 ..	6·0	6·0	1·2	0·252
Feb. 25 ..	6·0	5·8	1·13	0·117
March 13 ..	5·5	5·5	0·99	0·093

Renal Rickets.

The clinical characteristics of renal infantilism or dwarfism are now well known. The stunting of growth and delayed union of epiphyses often occurs without clinical or radiological evidence of rickets. It is equally certain that rickets occasionally complicates renal dwarfism, and, in one such case, Prof. H. M. Turnbull has demonstrated all the histological

FIG. 16.



Case 8.—Chemistry of the blood in idiopathic steatorrhœa with tetany and dwarfism.
The interval marks on the abscissa represent weeks.
Where the calcium intake exceeds 2 g., calcium lactate had been added to the diet. The dosage of irradiated ergosterol was measured in antirachitic rat units. Ultra-violet light was given by the mercury-vapour quartz lamp. The presence of Trousseau sign has been charted as latent tetany.

characteristics of true rickets. And yet this condition is not due to lack of vitamin D, but to a disturbance of endogenous calcium and phosphorus metabolism for which the chronic nephritis is evidently responsible. It is generally supposed that phosphate retention, due to the renal defect, is primarily responsible for the changes in the bones. Table III., from a case of renal rickets in a boy of 17, shows how the plasma inorganic phosphorus rises with the rise in blood-urea. The serum calcium tends to fall as the plasma phosphorus rises, hence the high incidence of tetany in this disease.

Diagnostic Value of Serum Calcium and Plasma Phosphorus.

We are now in a position to consider the value of the serum calcium and plasma phosphorus used as an aid to diagnosis. In Table IV. the first three columns

TABLE IV.—*Value, as an Aid to Diagnosis, of Serum Calcium and Plasma Phosphorus.*

—	Rickets.	Osteomalacia.	Steatorrhœa: tetany.	Hyper-parathyroidism.	Post-operative tetany.	Hypo-parathyroidism.	Renal rickets.
—	—	—	M. 56	F. 41	F. 43	M. 14	M. 18
Serum calcium.	9·6	6·0	5·8	16·7	6·3	4·9	7·4
	8·8	7·4	5·9	16·7	3·9	5·0	6·8
	9·7	5·6	4·7	15·8	6·4	5·3	7·1
	10·2	5·2	5·2	15·5	5·7	5·3	6·0
	—	7·0	4·9	—	3·9	5·2	6·0
	—	5·0	3·9	—	—	5·4	—
	—	—	3·9	—	—	—	—
Plasma phosphorus.	1·6	1·9	1·8	2·5	4·7	10·4	3·5
	2·9	1·8	1·0	1·0	5·0	10·7	5·0
	1·2	2·3	1·3	1·5	6·5	10·6	5·5
	1·6	2·5	1·5	1·7	6·0	10·4	6·0
	—	2·4	1·8	—	6·0	10·9	5·8
	—	2·0	1·8	—	—	10·9	—
	—	—	1·0	—	—	—	—

depict those conditions where absorption and utilisation are at fault. The plasma phosphorus is low in all three; the serum calcium is low, except in rickets where it is usually normal. In the last four columns are recorded repeated observations on the blood chemistry of individual cases, in all of which the endogenous calcium metabolism is at fault. Here an inverse ratio holds between calcium and phosphorus readings. In hyper-parathyroidism parathyroid *hyper*-function keeps the calcium high and the phosphorus low. In post-operative tetany and spontaneous hypo-parathyroidism, owing to parathyroid *hypo*-function, the reverse holds good. The result is that the serum calcium may be as low as

TABLE V.—*Chemistry of the Blood in Osteitis Deformans.*

Sex.	Age.	Serum Ca.	Plasma P.	Plasma phosphatase.
M.	49	10·8	3·3	0·66
M.	41	8·6	3·5	>1·4
F.	39	10·0	3·3	>1·3
F.	54	8·9	3·0	>1·2
M.	69	8·4	3·5	>0·7
F.	69	9·5	3·2	>1·2
M.	65	8·2	3·3	1·06

4·9 mg. per 100 c.cm., and the plasma inorganic phosphorus as high as 10·9 mg. per 100 c.cm. In renal rickets the plasma inorganic phosphorus is high, and the serum calcium low.

Osteitis Deformans.

In Paget's osteitis deformans the serum calcium and plasma phosphorus are approximately normal. Such studies as have been made of the calcium balance have given conflicting results, but no departure from the normal of any magnitude has been demonstrated. The discovery by Kay [21] that the plasma phosphatase is constantly high in this disease is of great interest (Table V.), though its exact significance has still to be discovered. It is useful in diagnosis though it is not pathognomonic, since high figures are also found in generalised osteitis fibrosa, secondary carcinomatosis of bones, and in some cases of exophthalmic goitre.

Osteogenesis Imperfecta.

In osteogenesis imperfecta (Table VI.) no abnormality in the serum calcium, plasma phosphorus, or calcium output has been satisfactorily demonstrated.[140] The plasma phosphatase is, in some cases, slightly raised. The cause of the defective osteoblastic apposition of bone is quite unknown. There are two cases recorded which showed enlargement of the parathyroids. The seven-months fœtus described by Bauer [141] had four enlarged parathyroids, the largest the size of the adult gland (3 mm. diameter). Histologically these showed hyperplasia. He relates

TABLE VI.—*Chemistry of the Blood in Osteogenesis Imperfecta.*

Sex.	Age.	Serum Ca.	Plasma P.	Plasma phosphatase.
F.	12	9·6	4·3	0·223
M.	9	10·4	4·5	0·270
M.	9	9·9	—	0·374
M.	17	10·3	3·8	0·331
M.	20	9·7	4·5	0·168
M.	42	9·6	2·8	0·162

that Dietrich [142] described another case. In the present state of our knowledge such observations are without explanation.

STORAGE AND EXCRETION OF LEAD.

Studies of lead poisoning have revealed a close analogy between the storage and excretion of lead and of calcium. Since lead is a cumulative poison there must be some place in the body where it can be retained in fairly large quantities. The work of Gusserow [143] in 1861, followed by that of Heubel,[144] showed that this storehouse was the skeleton. Minot and Aub [145] demonstrated quantitatively in animals and man a selective localisation of lead in the bones which becomes practically complete after absorption has ceased. Fairhall [146] studied such bones, and the results of his experiments suggest that the lead is present as the very insoluble tertiary phosphate. Various experiments showed that this is deposited in the calcareous portion of the bone and not in the marrow.

During different stages of intoxication by lead its distribution within the body varies somewhat. During slow absorption it migrates to the storehouse in the skeleton where about 95 per cent. is held without harm during the chronic stages of plumbism. However, if large quantities of lead are being absorbed or are being liberated from the bones, lead is distributed throughout the tissues and the percentage in the bones is reduced. Under these conditions symptoms of acute poisoning may occur. Working with human autopsy material, Minot and Aub have shown that the total amount of lead stored in the skeleton in lead workers varies from 0·2 to 0·8 g.

Lead stored in the bones may be gradually excreted in minute amounts over long periods. It has been found in the stools of persons who have been removed from exposure for more than two years, and Sir Thomas Oliver reports finding it in the urine of a woman 11 years after exposure. Thus, as suggested by Straub [147] in 1911, and by Erlenmeyer,[148] there may be an intermittent stream of lead entering the circulation to be excreted gradually.

Effect of Ammonium Chloride on Elimination of Lead.

Aub and Minot studied the conditions favouring and hindering liberation of lead from the bones in cats experimentally poisoned with lead. Early in their investigations they found that during starvation acute symptoms may develop, and at necropsy lead is found distributed more generally through the body than is typical of the chronic condition. This suggested that during starvation there is some abnormality in metabolism which sets free lead from the bones. Acidosis seemed the most probable explanation for the change, and an investigation based on this hypothesis was undertaken.

Lead workers were placed on a low calcium diet and were given either hydrochloric acid, phosphoric acid, or ammonium chloride in large doses. The excretion of lead in the fæces was markedly increased. The probable reason for the increased liberation of lead during acidosis is to be found in the experiments of Fairhall.[146] He studied the effect of variations in the hydrogen-ion concentration upon absorption of lead by bone. The tertiary phosphate of lead has an extremely low solubility at the normal pH of the body. However, under slightly more acid conditions, it is readily converted into the secondary phosphate of lead ($PbHPO_4$) which is a hundred times more soluble. Hence the ingestion of acid probably serves to liberate lead from the skeletal stores by converting it into a more soluble salt.

Effect of Parathyroid Extract in Lead Poisoning.

When active parathyroid extracts became available, the opportunity occurred for the direct confirmation of the hypothesis that the metabolism of lead is analogous to that of calcium. We [22] kept patients with chronic lead poisoning on a low calcium diet, and then gave them parathormone, with a view to determining the total output of calcium and of lead. For, under these circumstances, any large and prolonged rise in the blood calcium and in the calcium excretion would occur at the expense of the skeleton, and it was our purpose to discover whether or not the lead deposits would be mobilised with the calcium.

Parathormone definitely increased the excretion of lead when first given (Fig. 17). The amounts excreted were far greater than those obtained when potassium iodide, ammonium chloride, or phosphoric acid were given. When parathormone was given a second time, little or no increase in lead excretion was observed, though the extract was known to be potent because it produced its characteristic effects on calcium metabolism. Evidently parathormone rapidly and effectively mobilises from the bones a certain amount of stored lead which is readily available. The remaining lead is mobilised much more slowly in the normal routine of metabolism.

In our six patients the rapid mobilisation and elimination of large amounts of lead produced no ill-effect. However, we are not unaware that the procedures we used were very drastic and, used without due care, might produce the acute toxic episodes of plumbism. The action of parathormone in lead poisoning confirms the theory that there is a striking parallelism between the storage and excretion of calcium and of lead.

CASE 9. *Chronic industrial lead poisoning.*—A man of 55 years (M.G.H., Reg. No. 273240, 1925) had been employed for seven years in the mixing-room of a rubber works where a powder containing oxides of lead was used for vulcanising. The occupation was very dusty. For two months he had had attacks of generalised abdominal pain with severe constipation. The pain had persisted every day, and was often sufficiently severe to double him up. He had had a similar attack three years before. Exposure to lead last occurred two months before admission.

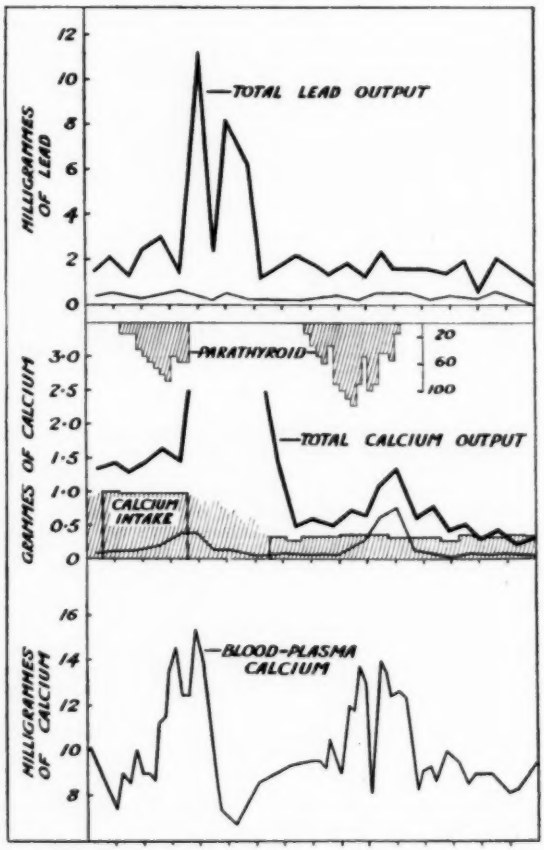
On examination he had a sallow appearance and a marked blue line on the gums. The abdomen was flaccid and showed no tenderness. No abnormal physical signs were found in the nervous system. The red cell count was 3,120,000 per c.mm., with marked stippling of the cells. Hæmoglobin 50 per cent. White cell count 8200 per c.mm. Polymorphonuclears 60 per cent. Lymphocytes 30 per cent.

After treatment of the constipation and five days on a high calcium intake all pain ceased. The effects of treatment by parathormone are to be seen in Fig. 17. The general condition continued to improve. After three months the blue line on the gums was scarcely more than a faint speckling. The red cell count was 4,100,000 per c.mm., and very few stippled cells could be found. The hæmoglobin was 70 per cent.

Storage of Other Elements in Bone.

There is a tendency for the selective localisation in bone not only of lead but also apparently of arsenic,[149] mercury,[150] silver,[151] and radium. Recently Flinn and Seidlin [152] have used parathormone in an attempt to increase the elimination of radium from the bones in factory workers poisoned by radium and mesothorium compounds. Such poisoning is known to occur where girls employed in painting the dials of luminous watches are in the

FIG. 17.



Case 9.—Effects of parathyroid extract and diet upon the excretion of lead and of calcium in lead poisoning.

The interval marks on the abscissa represent five days.

In the upper portion of the chart is shown the lead excretion. The faint line is the excretion of lead in the urine expressed in output for three days. The heavy line is the total excretion of lead in the urine and fæces for three-day periods.

In the middle portion of the chart the upper blocks represent treatment by parathormone; the adjacent scale represents units per day. The lower blocks represent the calcium intake in three-day periods, and, where the figure exceeds 0·7 g., calcium lactate had been added to the diet. The areas which have no enclosing block-line represent periods of unweighed high calcium diets. The faint line is the excretion of calcium in the urine expressed in output for three days. The heavy line is the total excretion of calcium in urine and fæces for three-day periods. The distance between heavy line and blocks, therefore, represents the positive or negative calcium balance.

In the lower portion of the chart is shown the blood-plasma calcium.

habit of pointing their brushes with their lips. Necrosis of the jaw and aplastic anæmia may result from the poisoning, alpha radiation being enormously destructive of the bones in which it is stored and also of the adjacent hæmopoietic marrow.

Use of Calcium Salts in Therapeutics.

A survey of the results of calcium administration in disease at once shows that, as a therapeutic agent, it has proved disappointing. The constant supply of calcium in the food and the large available store in the bones make it unlikely that the regulating mechanism ever lacks calcium for distribution throughout the body. It is when the function of some part of this mechanism breaks down that the tissues suffer from calcium deficiency. It therefore follows that the use of cod-liver oil, ultra-violet light, irradiated ergosterol, parathyroid or thyroid extract is often of greater value than the direct administration of calcium salts.

Need for a Diet Adequate in Calcium.

The use of well-balanced diets is not a necessary counterpart of an advanced civilisation. Thus it has been calculated[153] that the diet of the Finns contains between 2 and 6 g. CaO daily, whereas the equivalent figure for the average diet in the U.S.A. is only 0·45 g. Sherman[1] regards this figure with some alarm since he considers that one gramme a day is really required. He urges the use of "calcium carbonate or phosphate habitually added to human food by mixing it with table salt . . . or a more liberal use of milk, which is an important source of proteins of high nutritive efficiency and of the fat soluble vitamin as well."

If, then, a diet containing little calcium is to be regarded as a potential source of harm, how much more harmful must be the food consumed over large areas of China and India. There the diet may be deficient in calcium or phosphorus, may contain an excess of acid-forming over base-forming mineral elements, and above all is very likely to be deficient in vitamins or to be consumed by women kept in darkness.

A high calcium diet of adequate vitamin content is required by pregnant and lactating women to allow for the drain of calcium into the fœtus and especially through the mother's milk.

Owing to the great loss of calcium from the skeleton in exophthalmic goitre, attention should be paid to the mineral content of the diet in this disease.

Tetany.

In post-operative tetany success in treatment will vary according to how much parathyroid tissue has been destroyed. Calcium lactate may be employed as a powder taken fasting in repeated doses up to a total of 10 to 30 g. daily. In our experience these large quantities have never caused discomfort of any sort. Too often a few grains are given, in which case we can hardly expect much effect, since we know[154] that in normal individuals the maximal rise in serum calcium after a dose of 10 g. is only 14 per cent. More severe cases require parathyroid extract in addition to calcium salts, and even this may be ineffective when extirpation of the glands has been extensive. The onset of laryngeal spasm, bronchial spasm, or convulsions demands intravenous therapy; 20 c.cm. of a 5 per cent. solution of calcium chloride may be injected into a vein, and, if given very slowly, no ill-effects are produced. The use of thyroid extract and irradiated ergosterol in post-operative tetany has hardly passed the experimental stage.

Cameron [155] recommends the intramuscular injection of 1 gr. of calcium chloride in infants with laryngismus. In the tetany of rickets or osteomalacia the use of parathyroid extract is contraindicated except in emergency, since the increased serum calcium is brought about by the removal of calcium from the bones, which are already deficient in it. The administration of cod-liver oil or ultra-violet light may be all that is necessary for the proper treatment of the rickets or osteomalacia and for the relief of the tetany.

Lead Poisoning.

In the prevention of industrial lead poisoning a diet of high calcium content plays its part. In lead works in this country it has for many years been customary to supply the workmen, free of cost, with a glass of milk in the morning. This is empirical treatment of considerable merit, anticipating as it did by many years the discovery that a high calcium intake assists the storage of lead in a harmless form in the bones.

The toxic episodes of lead poisoning—namely, lead colic, lead palsy, and meningo-encephalopathy—may be regarded as urgent indications for calcium therapy. In this country the Home Office Regulations, by control of dusts and fumes, have abolished meningo-encephalopathy, but it would be idle to suppose that lead colic and lead palsy have disappeared from industry. It is difficult to estimate the death-rate in meningo-encephalopathy; it is probably quite high. Aub[51] states that of six cases three recovered promptly when given large quantities of milk and calcium lactate, and three died without such treatment. During the development of lead palsy a high calcium diet should be used to favour storage of lead.

After the acute toxic episodes have passed, elimination of lead may be accelerated by the use of a low calcium diet together with ammonium chloride. This is administered cautiously in 1 g. doses given in a glass of water six or eight times a day. Provided there is no nausea or headache this treatment is continued for two or three weeks, the patient being kept on a diet containing a strict minimum of 100 mg. of calcium a day.

Should any toxic episode appear, ammonium chloride must be stopped and a high calcium diet used to favour the storage of lead.

It is necessary to emphasise the difference between the use of agents assisting the excretion of lead and those assisting its storage. The acidosis method of lead elimination is so potent that its use during colic or meningo-encephalopathy might prove fatal, from the further mobilisation of lead at a time when the reverse procedure is essential in treatment.

Colic.

The question of the relief of lead colic by calcium therapy involves more than simply the tendency to favour storage; there is evidently an anti-spasmodic action on involuntary muscle. The only experimental evidence bearing on this is that of Kennedy,[156] who reported that by increasing the calcium content of the fluid bathing the uterine strip, the result in the uterine muscle was both a loss of tone and of peristalsis. The pain of lead colic is probably due to a contraction of the tonic ring in the intestine with marked peristalsis approaching this. A high calcium diet usually brings relief within 48 hours. In severe cases, by the slow intravenous injection of 15 c.cm. of a 5 per cent. solution of calcium chloride, it is possible to relieve the pain by the time the injection is over. The patient feels hot and flushed and may vomit. The effect on the pain is very striking and is far superior to that of any other means of therapy. Should it be necessary, the injection may be repeated in two hours.

By the same method Aub has brought about prompt relief from renal colic and gall-stone colic. Theoretically the relief of spasm should help in the passage of the stone, but this remains to be seen. An additional advantage of this method is that a differential diagnosis between the pain of renal colic and appendicitis can be made, the former being relieved promptly, the latter persisting.

Œdema and Inflammatory Exudates.

French workers, notably Blum,[157] have pointed out the diuretic action of calcium chloride in œdema. This is not a specific effect of calcium; it apparently results from a change in the balance of ions in the body fluids. Blum maintains that by increasing the calcium ions the sodium ions are decreased, and, since the retention of fluids is closely associated with the retention of sodium, the œdema is decreased.

Fraser[158] offers an alternative explanation. He points out that since ammonium chloride acts in a similar manner it is probably the acid properties of these salts which are responsible for their diuretic action, though the calcium may have an effect in the same direction by its antagonistic action to sodium.

Blum has extended his observations to inflammatory exudates and has reported beneficial effects in pleural and peritoneal effusions and in conjunctivitis. Workers on similar lines claim beneficial results for the administration of calcium chloride in asthma, angioneurotic œdema, and urticaria.

Acute Necroses of the Liver.

The accidental discovery by Minot[159] that a low calcium diet rendered dogs more susceptible to carbon tetrachloride poisoning led her to investigate extensively the chemistry of the blood in acute necroses of the liver.

Carbon tetrachloride causes a severe intoxication in dogs on a meat diet, while the addition of calcium salts to such a diet produces a high degree of tolerance to the drug. The symptoms of poisoning are gastro-intestinal irritation and hyperexcitability, followed by depression. There is a retention of guanidine in the blood and a hypoglycæmia. The relief and protection given by calcium seem to depend upon its antagonistic effect to the retained guanidine. When calcium is administered to poisoned animals the nervous symptoms are relieved and the blood-sugar is restored to normal. However, if the blood-sugar is raised by the administration of glucose, the hyperexcitability persists until calcium is given in addition. Similar results were obtained in a study of chloroform poisoning in dogs.

The investigation was then carried to liver disease in the human subject and more especially to eclampsia. Some cases showed hypoglycæmia and guanidine retention, and, where this was the case, prompt symptomatic relief followed the intravenous injection of 10 c.cm. of a 10 per cent. solution of calcium gluconate. For example, in a woman with eclampsia who was semi-conscious and blind, within 15 minutes of the injection the vision was much improved, within 40 minutes the sight was restored, and the blood-sugar raised towards normal. Though the number of cases studied was small it is clear that such a highly protective action of calcium salts against liver poisons is worthy of further investigation.

Milk Fever of Cows.

The essential clinical feature of "parturient paralysis" or "milk fever" of the cow is tetany. It may be confined to the hind limbs or it may be generalised. It is followed by deep coma and often by death. The cause of the condition is unknown but acute hypocalcæmia[160 161] is the determining cause of the symptoms. In its treatment inflation of the mammary gland has been practised for many years. It is now known that mammary inflation produces a rapid and regular rise in the blood calcium, and that this rise is concurrent with, and bears a direct relation to, the disappearance of the symptoms of the disease. Intravenous and subcutaneous injections of calcium gluconate[162] have been used successfully in treatment. It has been shown in the sheep[162] that "lambing sickness" or "ewe distemper" is identical in its essential pathology with "milk fever" in the cow.

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CHRONIC STREPTOCOCCAL ILLNESSES.*

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THE chronic illnesses commonly attributed to the streptococci are so varied and different, and the ætiological rôle of the streptococci in their production is or has been so hotly debated, that the best way of considering them as a whole is to review the evidence of a streptococcal origin of the main chronic streptococcal illnesses in turn in order to see what their relationship is, if any, and what are the factors which make any one disease different from the others. It may be urged that rheumatic carditis and ulcerative endocarditis are not chronic illnesses, but both of them may run a course of many months. Further, their consideration in conjunction with the others may help to throw some light on the obscure problems of streptococcal infection.

The first record of the association of streptococci with rheumatic carditis was that of Birch-Hirschfeld in 1888.[1] Thereafter, various observers reported streptococci, among others, as the causal organisms, until in 1900 Poynton and Paine [2] described the organism which they labelled *Diplococcus rheumaticus*. This was practically the start of the "streptococcal theory" of rheumatic carditis. Since that time different workers have found streptococci, but almost an equal number have recorded negative findings. When the streptococcus in question is identified more completely it is found to be non-hæmolytic and gives similar sugar reactions to those of the streptococci normally inhabiting the alimentary tract. Horder [3] showed that the same organism is the commonest infective factor in subacute bacterial endocarditis, and suggested that the cases of "malignant rheumatism" from which Poynton and Paine isolated their organism were actually cases of subacute bacterial endocarditis—a very important criticism if it is correct. The streptococci described by different workers showed minor variations in cultural characteristics, and Swift and Kinsella [4] pointed out that if streptococci have any causal relationship to rheumatic carditis no one type of the anhæmolytic group is concerned. Neither has it been possible with any degree of constancy to demonstrate agglutinins or other antibodies in the patient's blood to the organisms recovered from him. Animal experimentation, too, is negative, as no undoubted rheumatic lesion has yet been produced in animals. Injection of "rheumatic" streptococci produces arthritis and endocarditis, exactly as do injections of alimentary streptococci, but in all these cases the endocarditis is of the ulcerative type, and no rheumatic myocardial lesions are produced. The one exception is the possible production of "rheumatic nodules" by Clawson [22] by subcutaneous injection of anhæmolytic streptococci.

A fresh impetus to the streptococcal hypothesis was given in 1927 by Small [5] who described the "*Streptococcus cardio-arthritidis*" which produced a soluble exotoxin from which an antiserum was prepared. This antiserum is said to give encouraging results therapeutically. Birkhaug [6] then investigated the skin reactions produced by the exotoxin of a non-methæmoglobin-producing streptococcus obtained from cases of rheumatic fever. He found that a far higher percentage of patients who had suffered, or were suffering, from rheumatic fever gave a positive reaction than did normal healthy people. Irvine-Jones,[7] Kaiser,[8] Hart,[9] and others described similar findings, but there is no conclusive evidence whether the positive skin reaction indicates a susceptibility to infection, or a sensitised allergic state of the patient similar to the tuberculin reaction. The skin reaction showed no specificity to any one strain, and the investigators suggest that a rheumatic infection is an allergic response by patients previously sensitised to the common streptococci of the respiratory and alimentary tracts. Hitchcock and Swift [10] have shown in rabbits that different groups of the "indifferent" streptococci possess varying degrees of allergising capacity, and that the rabbits also show variations in their reactive capacity to any one organism from the allergic standpoint. Faber's [11] experiments are suggestive, showing that a previous infection of one joint by streptococci, when followed by a later intravenous inoculation, constantly produces arthritis in that joint. Intravenous injection with no previous sensitisation is without effect until repeated at least two or three times, which suggests an analogy to the primary development of the lesion of rheumatism in man.

The conclusions drawn by Coombs and Poynton [12] in the British Medical Association Report sum up very well the present position. They say that while the case for the streptococcal theory is not proved, it has as yet no rival. The more recent skin reactions and the allergic theory have rather strengthened the case for the streptococcal origin of rheumatism, so that it seems quite fair to include this as a chronic streptococcal illness, for the chronic smouldering character of the infection has long been recognised clinically.

Endocarditis.

The nomenclature of endocardial lesions is at the moment very confused because various workers have attempted to describe different clinical groups under differentiating names. However, as the ætiology and morbid anatomy of these groups essentially differs only in the virulence of the infecting organism, the condition may for convenience be called ulcerative endocarditis, which serves to distinguish it from the endocarditis associated with rheumatic pancarditis. The pathology of the acute fulminating cases which follow a general septicæmia is obvious, and they usually run an acute course, so that they can hardly be included as a chronic illness although a large percentage of them may be due to a virulent hæmolytic streptococcus. A large proportion of the subacute or chronic group, cases which may frequently run a course of over 12 months, and may, therefore, with some justification be called "chronic," are due to a streptococcal infection. Schottmüller [13] was the first to describe a streptococcus isolated from the blood of cases of endocarditis. This streptococcus was non-hæmolytic, and as it produced a green coloration when grown on blood-agar he called it *Streptococcus viridans*. Andrewes and Horder [14] and Gordon [15] showed that this organism belonged to the common types of streptococci found in the alimentary canal. Many workers have confirmed these findings, and statistics from various sources show that as many as 75 per cent. of cases of endocarditis may be shown to be due to an infection with the streptococcus.

The outstanding point in the ætiology of ulcerative endocarditis is the frequency with which this condition follows congenital cardiac defects and rheumatic carditis. The lesion is always localised and only spreads by direct implantation, and the myocardial lesions are embolic only—that is, the condition is purely an endocarditis. Recently, Grant [16] has shown that congenital defects and also previously damaged valves are frequently the site of small fibrinous deposits. Apparently organisms which, by some temporary breakdown of the surface resistance, have entered the blood stream, settle on these fibrinous tags and form a nidus of infection, in which they are safe from the normal bactericidal action of the blood. Presumably, such temporary invasions of the blood stream by the normal flora of the alimentary tract are not infrequent and are usually dealt with successfully by the normal antibodies. The infection and the localisation

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cannot be due to a loss of general resistance because of its localisation, and also because patients with such a lesion show a very high antibody content in their blood against the infecting organism, as has been shown by Kurtz and White [17] and other workers. Yet these patients are powerless to deal with the local infection and die, either as the result of large emboli or from uræmia, the sequel of embolic nephritis, or from cachexia and general toxæmia, from the repeated bombardment of the whole body with minute emboli. The local lesion, even the presence of the organisms in the peripheral circulation, appears to play a very small part in the actual illness. Further, cases of ulcerative endocarditis due to organisms other than streptococci show no clinical and very slight, if any, pathological differences from the streptococcal infections.

It has been repeatedly shown that the injection of streptococci of the alimentary tract into animals will reproduce the clinical and pathological picture of endocarditis in animals. A similar condition occurs in pigs after swine erysipelas. This disease, which is due to *Bacillus rhusiopathiæ suis* and is essentially an acute specific fever associated with a septicæmia, is followed in a certain number of cases by an endocarditis. This runs a very slow and protracted course, and corresponds in all essentials with the endocarditis occurring in man as the result of infection with a streptococcus of low virulence. It is clear that the organism itself is not the important factor of the disease, but rather a peculiar condition resulting from the localisation of the infective process.

Focal Infection.

It has been said that the pathology of focal infection is largely the pathology of the streptococci.[18] This being so, focal infection and its results obviously constitute one of the chronic streptococcal illnesses. The evidence for the existence of "focal infection" as a cause of chronic illnesses is rather vague and indefinite. The main "proof" seems to be that a condition improves after the removal of some septic focus, but this by no means proves that the condition was due to the focus of infection. It may improve after the removal of the "focal infection" for the simple reason that the patient's general condition is improved, without there being any closer relationship between the two infective processes. The case for focal infection is also weakened by the countless people who for years carry about septic tonsils or chronic apical dental infection and yet never develop any secondary condition. These cases show that if focal infection is a cause of chronic illnesses, even including vague general ill-health, the important and deciding factor in its occurrence is not the infection nor the infecting organism but the patient. The illness most confidently ascribed to focal infection is chronic arthritis, but so confused is this at the moment by the conflicting opinions as to nomenclature and types that even here its ætiological rôle does not seem too certain. However, if we accept the classification adopted by Douthwaite [19] and divide chronic arthritis into atrophic or rheumatoid, hypertrophic or osteoarthritis, and chronic infective arthritis we find that in the last group a very large percentage of the patients do present septic foci, and that the efficient removal of these leads to the cure of the condition. But there is very little, if any, sound evidence that the other two groups are due to "focal infection."

Apart from these "general" illnesses, streptococci may produce chronic "local" illnesses. These are of the nature of surface infections, and include such lesions as chronic tonsillitis, chronic bronchitis, and nasal sinusitis. In all of these the infection is usually a mixed one in which, however, streptococci predominate, amongst other organisms of doubtful pathogenicity. In apical dental infections, too, the most constant bacteriological findings are streptococci. In many such "local" infections the patient experiences no trouble except the local condition. In others he suffers from vague indefinite ill-health which improves after the eradication of the septic focus. This class includes cases like secondary anæmia or indefinite dyspepsias which clear up on removal of the dental sepsis. In yet another group the condition is associated with a definite disease entity, such as chronic infective arthritis. There appears to be no correlation between the degree of local damage or the type of infecting organism and the general systemic lesions. As has been pointed out, alleviation of the disease after the removal of the septic focus is not proof that the latter is the cause of the former, but it is certainly very suggestive. If this be accepted as a working hypothesis, it is clear that the one factor which is responsible both for the occurrence of systemic lesions and for the type they may take lies in the patient and is not a property of the infecting organism.

Recently, Wilkie [20] has produced evidence that a chronic cholecystitis is due to a blood-borne mural infection of the gall-bladder with streptococci. He claims to have shown also that the streptococci have a selective localisation, and pick out the gall-bladder, leaving other organs unaffected. It is interesting to note that repeated intravenous injections were necessary to produce cholecystitis with calculi in rabbits. This touches on the theory of elective localisation, so ardently championed by Rosenow. While admitting that certain organisms, such as *Bacillus typhosus* and the pneumococcus, do show a predilection for certain organs, one cannot help feeling that the evidence that the streptococci exhibit similar characteristics is as yet far from convincing. Trauma or previous sensitisation do definitely exert a localising effect, but that any one group of the streptococci possess the property of picking out one organ for the site of their activities requires more proof than is as yet forthcoming. Rosenow would go further than this, as he believes that organisms isolated from the tonsils of a patient suffering from appendicitis will produce appendicitis on animal injection. This work has received much criticism and very little confirmation, and up to the present time his case is very far from proved.

The Absence of Specificity.

When one reviews the wide range of chronic illnesses which are at the moment attributed to streptococci one is struck by the fact that there is no specificity in the type of streptococcus producing the lesion. The hæmolytic streptococci are rare as the causal organism of a chronic illness, so rare that in fact their occurrence may be doubted. The types which are found in these chronic illnesses are of the non-hæmolytic or *viridans* group. The difficulty of any accurate method of classification of the streptococci introduces an obvious difficulty into any discussion of their effects, but the conclusion which emerges from the large mass of work done on the subject points to the fact that this group of streptococci are not specific. Any of them may produce any of the lesions. The production of pathogenic effects depends apparently on the host, its previous environment and infections, and on the mode of entry of infecting organisms. In ulcerative endocarditis we are beginning to know some of the factors which turn a transient blood infection with an indifferent streptococcus (an event to which we are all probably subject at any time) into a lethal disease. We know that a very large percentage of the cases occur in patients who are the subjects of previous heart disease, either congenital or acquired. In the other diseases, the predisposing factors may be more subtle and elusive, of the nature of defects in the humoral defences rather than morphological defects, but they are there, and they are the important ætiological factor in the production of the disease. Further, Hitchcock and Swift [10] have shown that indifferent streptococci possess peculiar properties as allergising agents, which are not shown by any other organism. The various organisms in this group show variations

in this property, but it is common to them all in a greater or lesser degree; moreover, the reactive capacity of the inoculated animals varies widely with the same specimen. Derrick and Swift [21 23] have shown further that the hyperergy or allergy produced is not strain-specific and depends more on the method of inoculation than on the streptococcus used, and that in animals states varying from a high degree of immunity to a high degree of hypersensitivity may be produced, and moreover the hypersensitivity may be local.

The conclusion to which one is forced, both from experimental and clinical observation, is that the important factor in chronic streptococcal illnesses depends not so much on the infecting streptococcus as upon its mode of entry into the host, upon the host itself, and its previous experiences with the indifferent streptococci. Such a theory holds out a hope that one day we may be able to deal effectively with the chronic streptococcal illnesses. It is obvious that it is useless to try to deal with such infections on the same lines as those which are effective in dealing with diseases like typhoid or plague. In these infections we are able to a large extent to eradicate the infecting organism, but the streptococci are unfortunately ubiquitous. The solution of the problem lies in a better understanding of bacterial allergy and immunity. When we have discovered the difference between complete immunity, which makes the patient safe, and the dangerous state of allergy or hypersensitiveness, which is apparently a partial or perverted immunity, we shall have discovered the key to the practical treatment of the chronic streptococcal illnesses.

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PRINCE ALFRED HOSPITAL, SYDNEY.—The in-patients admitted during the year ended on June 30th, 1929, numbered 9526, of whom 5916 contributed towards the cost of their maintenance. This number is a record for any general hospital in the Australian Commonwealth. In the year the out-patients rose from 49,386 to 56,657, an increase partly due to the opening of the radium clinic—916 patients presented themselves at this special department. The average residence of in-patients was 20·70 days. At 9902 the number of operations has much more than doubled since 1913. The congestion in the out-patient department is such "that the situation is daily becoming quite intolerable," and the hope is expressed that the new State Hospital Commission will speedily provide the means for erecting new admission and casualty departments. The financial situation is "very much in the nature of a continuous nightmare." The year closed with a deficiency exceeding £53,000, besides an overdraft, guaranteed by the Government, of almost £112,000. The State subsidy for the year was £66,400.

MICRO-ORGANISMS IN PSITTACOSIS.

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HAVING regard to the interest shown in and the numbers of workers engaged on the small and probably short-lived outbreak of psittacosis in this country, I venture to record my findings in this preliminary note. Thanks to the kindness of my friend Dr. G. T. Western, of the Inoculation Department of the London Hospital, I have been able to examine a few films of blood from this disease. Dr. Western at first sent me two air-dried blood films from a woman suffering from psittacosis, dated Feb. 18th, 1930. These I fixed in alcohol and stained in Giemsa for 9 and 30 hours respectively, the stain in the latter case being renewed two or three times. With an entirely open mind I carefully examined these films, step by step, using a one-tenth inch oil immersion objective and compensating ocular 6—i.e., with a magnification of about 600 diameters, looking for the unknown, whether protozoa, bacteria, or virus bodies. After a very exhaustive, and even more exhausting, search of one of these films, extending over 28 hours, I found a few organisms which were definite enough to be suggestive. On examining the second film and looking more particularly for similar organisms, I found a very few quite definite specimens. Subsequently Dr. Western was good enough to send me the following:—

1. Air-dried films made from the blood, spleen, and liver of a hen successfully inoculated with human material on Feb. 25th.
2. Two air-dried films made from citrated blood from a case at Eastleigh, dated March 1st.
3. A small tube of citrated blood from a case at Guy's Hospital dated March 4th. The resident medical officer at Guy's Hospital later kindly sent me blood films from this case, a woman aged 19, on the twentieth day of disease, dated March 12th.
4. Films from heart blood and spleen of a mouse, M.12, inoculated on March 14th from a parrot which died of the disease on the 20th.
5. A small quantity of the filtrate from the spleen of a mouse, M.28, which died, four days after the inoculation, on March 26th. Subsequently Dr. Western informed me that this filtrate was virulent and produced the disease in a mouse.

In all these cases the method adopted was the same. The air-dried films were fixed in alcohol and stained in Giemsa. The citrated blood was centrifuged and films made from the deposit, whilst a small drop of the filtrate was spread on a perfectly clean slide, and when dry these were stained in exactly the same way.

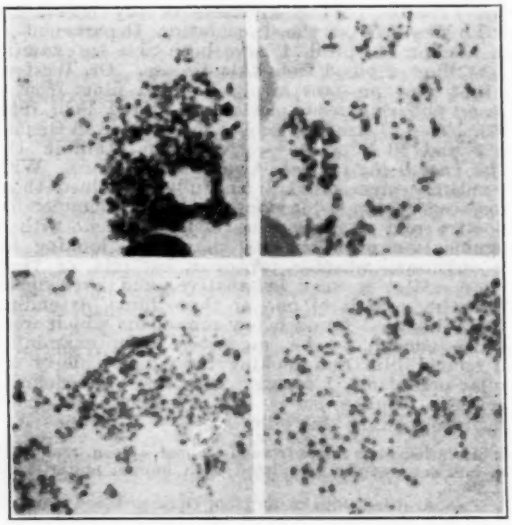
The Organisms Found.

Very similar if not identical organisms were found in all these specimens—viz., minute diplococcoid and coccoid bodies, and in most cases a very few small bacilli or diplobacilli. The most characteristic were the diplococcoid bodies, which consisted of two minute well-defined dots, varying slightly in size and usually staining red with Giemsa. In a few films, especially in preparations made from citrated blood, they stained a pale blue. The average measurement of these paired cocci is about 0·6 to 0·7 μ in length, and about 0·3 to 0·4 μ in diameter. In one of the human blood films two or three ordinary cocci and diplococci were seen, and the contrast in the size and the deep-blue staining of these with the minute, generally red-staining diplococcoid bodies found in this disease was very striking. Isolated coccoid bodies were also seen, but of course they were not as conspicuous as the paired bodies.

The bacilli were very thin rods measuring on an average about 2 μ, very sharply defined, and

usually staining a red colour with Giemsa, but in a few films having a blue tint. On very careful examination of typical examples they are seen to have a division in the centre, so that they apparently consist of two minute bacilli. A few bacilli stained red were found to be somewhat longer, reaching 3 or even 4 μ in length, and some of these showed a beaded appearance. The diplococcoid forms were found in very small numbers in all the cases, but the bacilli were extremely scanty, only three to five being found in a film.

The coccoid and paired coccoid bodies were more numerous in the blood and especially the spleen of



Film from the spleen of an inoculated mouse showing free and intracellular groups of the coccoid *x* bodies of psittacosis.

the hen, whilst in the liver of the hen they were not much more numerous than in the blood. The filtrate from the infected mouse was examined in Giemsa-stained films, in preparations made with Indian ink, and with nigrosin as in Burri's method, and by dark-ground illumination. A very large number of minute coccoid bodies was shown by all these methods, but, as was anticipated, considerably fewer diplococci were present.

Distinctive Bodies in the Spleen of the Inoculated Mouse.

Films of the blood of the inoculated mouse showed relatively numerous coccoid and diplococcoid bodies, and two or three red-stained bacilli were also found. But the films made from the spleen of the same mouse showed the most important and suggestive structures. Here I found not only isolated and scattered coccoid and paired coccoid bodies but, on prolonged search, I came across several groups or clusters of these structures. These agglomerations, which were for the most part lying free, varied in size according to the compactness or otherwise of the granules, and generally measured about 6 to 10 μ in diameter. They stained a peculiar bluish-red colour with Giemsa, and were quite readily distinguished from the very numerous cell granules present. When one-half of a Giemsa-stained film was treated with a drop or two of orange tannin (orange G 1, tannin 5, water 100) for a minute or two and then washed, these small masses were exceedingly well differentiated, and were totally unlike other granules. The groups consisted of fairly closely packed coccoid bodies, single, in pairs, or three or four together. Their outline is remarkably definite, and I find, from photomicrographs taken at a magnification of 2000 diameters, that they measure about 0·25 to 0·45 μ. Mr. Eliot Merlin, by very exact measurements, says that he finds that the smallest range from 0·24 to 0·3 μ, but that many are somewhat larger. Not only are these clusters found free, but some are also seen in the interior of greatly swollen endothelial cells, and their sharp outline, somewhat regular size, and the peculiar staining reaction prevents confusion with the normal cell contents.

To my mind they very closely resemble some of the rickettsia bodies. I compared them with a slide of *Rickettsia prowazeki* of typhus fever in the louse, and they bore a striking similarity to the coccoid and paired coccoid stage of these bodies, but the colour was somewhat different, the rickettsias being bright red (possibly from the fading of the blue of the Giemsa stain, as the film was made in 1922).

The photomicrographs (see Figure) taken at a magnification of 1500 diameters are here reproduced at a magnification of about 2200, and show the distinctive features of the coccoid bodies in clusters from the spleen.

The question which naturally arises is: What is the nature of these organisms; are they accidental, commensal, or secondary invaders, or are they causal? Any speculation about their nature or relationship must be premature at this time, with such limited material at hand, and much more work must be undertaken before a definite expression of any opinion can be given as to the part they play in the causation of psittacosis. I am of the opinion that the small bacilli will prove to be secondary invaders, but that the coccoid and diplococcoid bodies found in the blood of man and infected animals are probably identical with the very characteristic and suggestive groups or masses of these bodies in the spleen of the inoculated mouse. The coccoid bodies are small enough to pass the Seitz filters and have been very definitely found in the filtrate, and these may prove to be the causal organisms of this obscure disease. They might provisionally be termed the coccoid X bodies of psittacosis.

I would here like to express my sincere thanks to Dr. Western for his kindness in sending me specimens.

CÆSAREAN SECTION UNDER SPINAL ANÆSTHESIA.*

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THE obstetrician is always faced with a very difficult problem when called upon to deal with pregnancy and labour complicated by a serious cardiac lesion and weak or failing compensation. There is another type of case which causes considerable anxiety—the patient faced with a complicated labour, who is at the same time suffering from bronchitis or some other respiratory difficulty which would render a general anæsthetic risky. During the past two years I have performed Cæsarean section under spinal anæsthesia on ten patients; seven of these were suffering from advanced cardiac disease with failing compensation, one had severe bronchitis and malpresentation (flying fœtus), and two were cases of contracted pelvis. It is extremely doubtful that any of the cardiac cases would have survived even a simple straightforward labour.

Technique.

No morphia or other sedative is given before the operation. The patient is placed upon the operating table lying on the right side with the knees drawn up and the back arched forwards. One of the lumbar spaces is chosen just above the level of the iliac

* Read before the North of England Obstetrical and Gynæcological Society, April 11th, 1930.

crests. The needle is inserted into the skin just below the midline and on a level with the centre of the space between two lumbar spines. The needle is pushed forwards, inwards, and upwards. It is easier to find the spinal canal by this method than by placing the patient sitting upright. A 10 c.cm. syringe which has previously been charged with stovaine 1 c.cm. is then inserted into the spinal cannula, and an equal quantity of spinal fluid is withdrawn and mixed with the stovaine solution in the syringe. The mixture is then slowly injected. The preparation of stovaine which I use is the stovaine Billen (Chaput formula) put up by Messrs. May and Baker. With this preparation I have not had a failure. After the injection the patient is turned upon her back and the shoulders slightly elevated. Usually by the time the surgeon is ready to operate the patient is anæsthetic up to the costal margin.

The classical Cæsarean section was carried out in all cases and in all the anæsthesia was perfect. The outstanding feature of the operation was the small amount of blood lost by the patient, particularly on incising the uterus, except in those cases where the placenta was situated on the anterior wall. The uterus in all cases contracted very strongly and rapidly upon delivery of the infant. This hypertonic contraction of the uterus associated with spinal anæsthesia has also been noted by Metzger[1] who states that because of this spinal anæsthesia is not advisable for such obstetrical operations as the application of forceps or version.

Most of the patients midway through the operation complained of "feeling sick." Whether this was a symptom of falling blood pressure or to interference with the peritoneum I cannot say. The injection of 0·5 c.cm pituitrin produces relief at once. Sensation begins to return in about one hour and a half and is complete in three to four hours. The first complaint is abdominal pain. There were no post-operative complications of any severity. Severe headache was noted in three cases which persisted for about twelve hours.

In cardiac cases operated upon it was noted that the operation had no appreciable effect upon the patient as far as one could tell from the pulse-rate. All the cases made good recoveries from the operation and were able to leave hospital at the end of three weeks. In all the cardiac cases compensation was to a certain extent restored—i.e., they could get about quietly, the orthopnœa and dyspnœa had disappeared, and they were able to nurse their babies without undue effort. It is a moot point whether these patients should be allowed to nurse the child or not. In my experience I have not found that nursing throws any special burden upon these patients' cardiac condition, I therefore encourage nursing for the first three or four weeks at least. As these patients' families are of necessity limited, it is very important that the infant should be launched upon the sea of life under the best possible circumstances. This can only be brought about by meeting its normal physiological needs in the early days of its existence.

The following is a short account of the cases operated upon :—

CASE 1.—Multigravida, aged 32. Five normal labours and one transverse. Condition on admission: severe bronchitis, cough, dyspnœa. Pregnancy: period 39 weeks; malposition of fœtus (flying fœtus) reported in THE LANCET, 1928, ii., 751. Termination of pregnancy: Cæsarean section. intrathecal stovaine. Result: uneventful recovery. Abdominal pain two hours after operation, sensation complete in four hours. Lochia red to the tenth day. No headache. discharged fit in 14 days.

CASE 2.—Primipara, aged 23. General condition good. Pregnancy: period full term; contracted pelvis with marked disproportion. Termination of pregnancy, Cæsarean section. Intrathecal stovaine. Result: uneventful recovery. No headache. Sensation complete in four hours. Discharged fit in 14 days.

CASE 3.—Aged 24, 2-para. One child, Cæsarean section at term. General condition good. Pregnancy: period full term; contracted pelvis with marked disproportion. Termination of pregnancy, Cæsarean section. Intrathecal stovaine. Result: uneventful recovery. No headache. sensation complete in 3½ to 4 hours. Discharged fit in 14 days.

CASE 4.—Multigravida, aged 35. Three normal labours, one transverse. Rheumatic fever when 7 years old. Condition on admission: fainting attacks, dyspnœa, orthopnœa, pyrexia. Mitral stenosis with very poor compensation. Pregnancy: period on admission 35 weeks. Termination of pregnancy, Cæsarean section. Intrathecal stovaine in thirty-ninth week. Result: operation appeared to have very little affect upon the patient's cardiac condition. Slight nausea during operation. Sensation complete in four hours. Discharged fit on twenty-third day.

CASE 5.—Aged 42, 11-para. Nine normal labours and two miscarriages. Rheumatic fever when 31 years old. Condition on admission: very breathless and distressed orthopnœa, cough, has had two attacks of epistaxis. Mitral stenosis and aortic regurgitation. Compensation poor. Pregnancy: period on admission 33 weeks. Termination of pregnancy, Cæsarean section. Intrathecal stovaine at term. Result: operation no affect on cardiac condition, pulse 76 at end of operation. Slight abdominal pain complained of four hours after operation. Sensation complete four hours, lochia red to the tenth day. Discharged fit on the seventeenth day.

CASE 6.—Primipara, aged 24. Has been in heart hospital for considerable time. Condition on admission: dyspnœa, orthopnœa, cough, mitral stenosis, very poor compensation. Pregnancy: period on admission 37 weeks. Termination of pregnancy: intrathecal stovaine in thirty-eighth week. Result: operation had no affect on pulse-rate. Abdominal pain complained of at end of three hours, sensation complete in four hours. Delusions on third day. Lochia red to tenth day. Good recovery. Discharged fit on twenty-first day. Nursing.

CASE 7.—Aged 24. Condition on admission: dyspnœa, orthopnœa, mitral stenosis, poor compensation. Pregnancy: period on admission 35 weeks. Termination of pregnancy: intrathecal stovaine at term. Result: good recovery from operation. Compensation slowly restored. Discharged fairly well in three weeks. Nursing baby.

CASE 8.—Aged 30. Condition on admission: rapid irregular pulse, dyspnœa, and orthopnœa; mitral stenosis, poor compensation. Pregnancy: period on admission 34 weeks. Termination of pregnancy, intrathecal stovaine near term. Result: good. Uneventful convalescence. Discharged from hospital in three weeks. Nursing baby.

CASE 9.—Aged 24, 2-para. One premature child and one miscarriage. Chorea when 14 years of age. Condition on admission: marked dyspnœa, orthopnœa, œdema of legs and vulva; rapid irregular pulse, some cyanosis. Later developed cough. Cardiac lesion: mitral stenosis and some regurgitation; very poor compensation. Period of pregnancy 30 weeks. Termination with intrathecal stovaine in thirty-eighth week. Result good. Pulse-rate not increased by operation. Uneventful recovery, except that chest was troublesome for about ten days. Compensation only very slowly recovered. Discharged on the twenty-first day fairly well and nursing child.

CASE 10.—Aged 29, 3-para. Two normal labours and one miscarriage. Condition on admission: dyspnœa, cough, cyanosis, and œdema of legs. Mitral stenosis, some auricular fibrillation, poor compensation. Period of pregnancy on admission about 22 weeks Termination of pregnancy: intrathecal stovaine at term. Result: good pulse-rate not affected by operation. Convalescence complicated by the fact that the patient burst all her stitches on the fifth day by coughing. The abdomen was sutured without an anæsthetic. After this the patient made a good recovery. The chest symptoms slowly disappeared and compensation gradually restored. Severe headache was complained of on the second day. Discharged on the twenty-fourth day fairly well.

Conclusions.

Cæsarean section under spinal anæsthesia is an ideal method of dealing with pregnancy complicated by a serious cardiac lesion. The operation in my experience throws no strain upon the heart and in the seven cases dealt with in this note the evidence of shock resulting from the operation was completely absent.

As a method of terminating pregnancy in these cases it is much to be preferred to induction of premature labour or delivery by forceps. It is, in my opinion, very risky to allow a patient with a serious cardiac lesion and failing or poor compensation to undergo the stress of even a simple labour. An added advantage of Cæsarean section is that sterilisation can be carried out at the same time. This is important when the cardiac lesion is a serious one.

It is essential in dealing with these cases that the cardiologist and the obstetrician should work together.

[1] Metzger: Rev. Franç. de Gyn. et d'Obst., January, 1929.

I have been most fortunate in having the enthusiastic help of Dr. John Hay and Dr. Wallace Jones. I am greatly indebted to them for the way in which they have supervised the treatment of the patients while in hospital or rest home.

PROOF OF PATENCY OF A COMMON BILE-DUCT

BY INJECTION OF LIPIODOL.

By W. B. GABRIEL, M.S. Lond., F.R.C.S. Eng.,

SURGEON TO THE ROYAL NORTHERN HOSPITAL; SENIOR ASSISTANT SURGEON TO ST. MARK'S HOSPITAL FOR DISEASES OF THE RECTUM.

DRAINAGE of the common bile-duct after its incision for removal of a stone is now the universally accepted practice. The advantage, in certain cases, of prolonged drainage by the use of a T-tube has been pointed out by Judd and White.[1] The tube can be left in situ for many months if necessary and permits of a free exit of bile. If any serious degree of cholangitis or pancreatitis is present the prolonged rest is very beneficial, and if there is any debris or biliary mud in the common bile-duct regular lavage with saline is easily carried out. When the time for removal of the tube draws near it may be clamped for a number of hours and the effect on the patient observed; if no discomfort results the presumption is that bile is flowing down freely through the short limb of the T-tube.

A recent paper by Ginzburg and Benjamin[2] entitled Lipiodol Studies of Post-operative Biliary Fistulæ suggested to me that with a T-tube in the common duct the patency of the duct might readily be proved by injection of lipiodol before removal of the tube.

A married woman, aged 45, had an operation for acute appendicitis in India during 1926. Later she had a residual pelvic abscess which had to be drained, and in 1927 she had an attack of jaundice.

On Feb. 2nd, 1930, an attack of acute abdominal pain began; it was localised chiefly to the right upper quadrant and was accompanied by obstinate constipation. She called in her doctor, Dr. W. C. B. Meyer, for the first time on Feb. 7th, and I saw her in consultation the same day. She then had had severe vomiting for three days, her bowels had not been open since Feb. 2nd, and an enema had been returned clear. Her temperature was 101·6° F. and the pulse-rate 120. Abdominal examination revealed a large tender mass in the right upper abdomen suggestive of an acutely inflamed gall-bladder. In view of the possibility of an intestinal obstruction I advised immediate laparotomy and the patient was transferred to the Royal Northern Hospital.

First operation (cholecystostomy, Feb. 7th).—An incision over the mass revealed a large acutely inflamed gall-bladder with adherent omentum, and flakes of lymph on its surface. The patient's general condition was very bad and her pulse-rate went up to 170 on the table. A cholecystectomy was therefore considered to be inadvisable, and I completed the operation rapidly by emptying the distended gall-bladder of a large amount of foul-smelling pus with a trocar and cannula and stitching in a large-sized de Pezzer catheter with the end cut off. She made a good recovery. The tube was removed on the tenth day after operation. The wound was healing well without any biliary leak until Feb. 27th when she had an attack of vomiting and a copious discharge of bile appeared from the sinus in the abdominal wall. A profuse biliary leak continued and her stools became clay-coloured. An X ray did not reveal a calculus but obstruction of the common bile-duct by a calculus appeared probable.

Second operation (March 14th).—I explored the biliary passages through a transverse incision after infiltration of the abdominal wall with percain solution 1 in 1000. A large solitary oval stone was milked up from the lower part of the common bile-duct and was removed after incising the common duct over it. A cholecystectomy was then performed and the common duct drained by insertion into it of a Kehr's T-tube. Subsequent progress was uneventful. Bile drained freely from the tube which was washed through with saline solution every four hours. On March 21st it was clipped for an hour morning and evening. This caused no discomfort and the clip was gradually applied for longer intervals up to three hours twice daily.

On April 2nd the accompanying radiograms were taken. Fig. 1 shows the tube in position. Lipiodol was then injected and the radiogram shown in Fig. 2 was taken as soon as the lipiodol was seen on screen examination to have reached the common duct. It reach the duodenum very rapidly and proved that there was no obstruction in the distal part of the common duct. The radiogram seen in Fig. 3 was taken about one minute later and shows the left and right hepatic ducts outlined and general diffusion of the lipiodol through the upper loops of the small intestine. On the 4th the tube was clamped continuously for 48 hours without causing any symptoms

FIG. 1. FIG. 2. FIG. 3.

Showing the T-tube in position in the common bile-duct 19 days after operation.

Taken immediately after injection of lipiodol into the tube; the opaque solution has reached the duodenum without delay.

Taken a minute later, showing the left and right hepatic ducts outlined and general diffusion of lipiodol throughout the small intestine.

[1] Judd, E. S., and White, R. B.: Collected Papers of the Mayo Clinic, 1928, p. 144.

[2] Ginzburg, L., and Benjamin, E. W.: Annals of Surg., February, 1930, p. 233.

and was removed by gentle traction on the 10th after preliminary injection of morphia and scopolamine.

The biliary fistula was closed in 24 hours and the patient is now convalescent; she is free from symptoms, her stools are of normal colour, and her complexion is clear.

Clinical and Laboratory Notes.

TWO CASES OF INTESTINAL DISEASE IN INFANCY.

By Anne E. Somerford, M.D. Manch., D.P.H.,

PATHOLOGIST TO THE ROYAL MANCHESTER CHILDREN'S HOSPITAL PENDLEBURY.

THE two following cases of intestinal disease in infancy appeared to be worthy of record, owing, in one case to the rarity of the condition at such an early age, and in the other to the clinical signs and symptoms.

Perforation of a Duodenal Ulcer in a Child of 14 Days.

The patient was a full-time male child (labour and delivery had been normal) who at the age of 12 days began to vomit all his feeds, the vomit being projectile in type, while the bowels became confined. Two days later he was brought to the out-patient department of the Royal Manchester Children's Hospital and was admitted at once as an in-patient, but died a few hours after admission. While in hospital he vomited continuously, the vomit consisting of a deep orange-coloured fluid, evidently containing bile. It was not, unfortunately, examined for blood. The abdomen was very distended but visible peristalsis was not seen.

At the autopsy the following condition was found. The child was an emaciated infant and the abdomen was much distended. The chest contents were normal. The peritoneal cavity was found to be filled with orange-coloured fæces which had even penetrated to the posterior surface of the liver. There was a small, round perforation on the anterior surface of the duodenum one centimetre beyond the pylorus. This perforation was about three millimetres in diameter and fæces were oozing through it. In spite of gentle handling the aperture rapidly increased in size, as though the surrounding wall were very friable. To the naked eye the duodenal wall appeared to be normal and sections also failed to reveal any abnormality. The stomach, pylorus, and the rest of the small intestine were normal. The cæcum was much dilated and filled with fairly solid fæces. The ascending and transverse colon were normal. In the descending colon there was a narrowed portion about two centimetres in length, but fæcal material could easily be squeezed through it. The liver, kidneys, spleen, and pancreas were normal. In the mesentery were numerous small bodies varying up to the size of a hazel nut. They were rounded and pale pink in colour and on section proved to be fibromyomata. The skull presented a suture about 1·5 cm. in width; passing across the frontal bone and reaching almost to the bridge of the nose, and there was much bossing of the frontal bone. The lower jaw was unduly prominent.

Congenital Diverticulum of the Jejunum.

A male child, aged 7 months, was admitted to the Royal Manchester Children's Hospital, Pendlebury, on Sept. 30th, 1929, with a history of vomiting, abdominal pain, and melæna of two months' duration. Examination revealed extreme pallor of the mucosæ and yellowish discoloration of the skin surface generally. The liver was just palpable, but there were no other physical signs. A blood count showed a severe anæmia of a secondary type (red cells, 1,752,000; hæmoglobin less than 20 per cent.; leucocytes, 10,800). During his stay in hospital he vomited once daily, and the stools, with one exception, contained occult blood. On Oct. 12th, 1929, a subcutaneous injection of citrated maternal blood was given into each axilla, but death took place three days later.

At autopsy the child was well formed, rather fat, and extremely pale. The heart and lungs were almost colourless. The liver and kidneys were pale, and the spleen was enlarged and pulpy. A very careful scrutiny of the stomach and intestinal tract failed to reveal the presence of any ulcer or bleeding point. Arising from the jejunum on the mesenteric side was a sac measuring 9·75 cm. in length by 4·5 cm. in width. It was attached along its entire length to the jejunum with which it communicated at the proximal end by an opening 2 cm. in diameter. The distal extremity of the sac was blind and was filled with dark-coloured fæcal material. Sections were not made of the sac wall, but to the naked eye it resembled the small intestine. There was no apparent bleeding point or ulceration within the sac, but as proximal to the mouth of the sac the intestinal contents were pale yellow, and distally they were dark, it appeared that the sac was responsible for the hæmorrhage.

Moynihan[1] collected 13 cases of duodenal ulcer in infants between 6 weeks and 10 months of age. Rogers[2] reported two cases of duodenal ulcer occurring in infants of the same family, but without perforation. Theile[3] collected 264 cases of gastro-duodenal ulceration of which 58 per cent. were duodenal in type. I have failed, however, to find any record of a perforation occurring at such an early age.

I wish to thank Dr. C. P. Lapage and Dr. J. F. Ward for their kind permission to publish the clinical notes of these cases.

LOCAL ABSORPTION OF FAT DUE TO INJECTIONS OF INSULIN.

By L. R. Woodhouse Price, B.A. Camb., M.R.C.S. Eng.

Local atrophy of fat following the prolonged treatment of diabetes mellitus by injections of insulin has been described by Avery,[1] Rabinowitch,[2 3] and Graham and Carmichael,[4] but hitherto no account of the post-mortem appearances has been published.

The opportunity arose in the case of a woman aged 34 years who was admitted to St. Bartholomew's Hospital on Nov. 2nd, 1928, in coma. She developed diabetes mellitus in 1924, and was successfully treated as an out-patient by injections of insulin in doses varying from 5+5 to 20+20 units per day for four months. Thereafter the treatment was continued by the self-administration of insulin and she progressed satisfactorily up to a few days before her admission. She suddenly became comatose and died in spite of adequate insulin treatment.

Post mortem a depressed area was found on the anterior surface of each thigh, in the region of the apex of Scarpa's triangle. This area was about two inches in diameter in each case. A section of the tissues of one thigh was removed, about half an inch in thickness. Macroscopically (see Figure) it shows the absence of subcutaneous fat over a limited local area. The overlying skin is rather whiter than usual, and its surface is slightly depressed. No gross pathological change is evident in the skin or in the muscle of the thigh. Microscopically, the structure of the skin is unchanged. In one part of the section there is no fat intervening between the skin and the muscle, the connective tissue having the appearance of being condensed. No cellular infiltration or indication of inflammatory reaction is apparent.

Sketch of skin and subcutaneous tissue showing absence of fat over a limited area.

It is not known for certain that the patient injected the insulin at these sites, for the condition was discovered only after death. The specimen has been preserved in Kaiserling's solution.

I wish to thank Prof. F. R. Fraser, who had charge

[1] Moynihan, B.: Duodenal Ulcer, London, 1910.
[2] Rogers, J. S. Y.: Arch. Dis. in Childhood, 1928, iii., 163.
[3] Quoted by Hurst, A. F., and Stewart, M.: Gastric and Duodenal Ulcer, London, 1929, p. 28.

of the case, for permission to publish this note on the post-mortem findings, and Dr. T. H. G. Shore, curator of the Pathological Museum at St. Bartholomew's Hospital, for permission to publish a sketch of the specimen.

References.—1. Avery, H.: Brit. Med. Jour., 1929, i., 597. 2. Rabinowitch, I. M.: Canad. Med. Assoc. Jour., 1928, xviii., 560. 3. Rabinowitch, I. M., Ibid., 1929, xxi., 67. 4. Carmichael, E. A., and Graham, G.: THE LANCET, 1928, i., 601.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF UROLOGY.

AT a meeting of this Section held on April 30th, Mr. FRANK JEANS, the President, being in the chair, Prof. HUGH YOUNG (Johns Hopkins University, U.S.A.) gave an address on the advantages of

THE PERINEAL ROUTE

in the treatment of various diseases of the prostate. It was not his purpose, he said, to persuade his hearers that perineal prostatectomy was superior to suprapubic—Sir Peter Freyer and his associates had done so much to show its value. But owing to the success which urologists in England had had with the suprapubic route, it was perhaps not sufficiently appreciated that the perineal route could well be employed for other pathological conditions of the prostate. One reason for the unpopularity of the perineal route in early days was the use of the median incision, the operator plunging his knife through the perineum, cutting through the bulb, with consequent free bleeding, through the triangular ligament, through the external sphincter, and if he were not careful, incising rectum or bladder, when not only serious hæmorrhage but incontinence resulted. Early perineal prostatectomists such as Goodfellow tore or cut through these structures; Charles Mayo devised a method of enucleating parts of the lobes; and consequently perineal prostatectomy came to be associated with a risk of damage and hæmorrhage, and also of incontinence and disturbance of the sexual function owing to interference with the ejaculatory ducts and other delicate structures. In reaching the prostate, his hearers knew the importance of avoiding those structures which early urologists so frequently injured. It was necessary to cut at the back of the bulb and the two transverse peronei muscles, so as not to injure the sphincter. Two layers of fascia seemed to have been put there by Nature to protect adjacent structures; they shielded the rectum from infection, and caused malignant disease to pass upwards instead of through the rectum. As the prostate increased in size the urethra became flattened from side to side, while the middle lobe extended through the sphincter into the bladder, causing obstruction there and giving rise to hypertrophy of the trigone.

One advantage of operating on the prostate through the perineum was the ready production of local anæsthesia by a single injection through the sacral canal. Difficulty if it occurred was due to the patient's position. If a flat table was used no adequate view could be obtained of the field of operation. He showed on the screen a picture of the special table he used; good results, however, could be obtained on an ordinary table by means of sandbags and straps. At a later date the median incision was replaced by an oblique incision to one side, which was found safer and caused less hæmorrhage. It also brought the operator straight into the apex of the prostate, without destroying important structures. Even to-day few surgeons could show a better series of results than some operators had with this method. The operation was based on the triangular ligament and the ischiopubic ramus. After the primary incision the surgeon used blunt dissection on each side of the median raphe, avoiding injury to the transverse perineal muscle. The central tendon was brought into view by means of a bifid retractor. In most cases the prostate was brought out, so that the operator could see what he was doing. It should be palpated and the diagnosis confirmed before proceeding. If the case was one of prostatic hypertrophy, the enlargement could be extracted through a variety of incisions. The median incision would give the same result as the suprapubic; or the incision might be peri-lobular, or bilateral, or in the form of an inverted "V." He had tried every kind and was not yet satisfied as to which was best; the "V" incision opened the part up and made it easy to enter and enucleate the two lateral lobes. Scissors could be used if care was taken to do no injury to tissues which were not pathological and which were to be left behind. In many cases it was possible to follow the aberrant lobules beneath the trigone and to remove them in one piece with the lateral lobes.

Where a previous cystoscopy had showed the presence of hypertrophied tissue in the anterior commissure or the anterior lobe it was desirable to remove the commissure also. That gave the sort of specimen which Freyer nearly always obtained; he broke through the mucous membrane and enucleated the pathological prostate from the outside of its encapsulated fibres, nearly always removing a portion of the anterior commissure and the anterior part of the urethra with it. It could be done in that way through the perineum if the surgeon started from the outside and went round as Freyer did, removing the hypertrophied prostate in one piece. Most American surgeons who practised suprapubic prostatectomy went through the urethra and did not remove the anterior commissure. If the patient had a very large middle lobe, much less tissue was dragged through the sphincter in the perineal operation.

In the majority of cases, said Dr. Young, he used the bilateral incision, the objection to which was that the hypertrophied tissues or lobes could not be removed in one piece. It was more conservative than the inverted "V," as there was less injury to the urethra; the first cases he did by this method healed up more quickly, and there was less disturbance of the sexual function than in other cases. But there was also less chance of inspection and of being sure that the tissue to be removed had all been taken away. This procedure was advisable for cases of carcinoma which had gone too far to permit of radical operation. In a fair proportion of cases when operating through the perineum the surgeon encountered calculi lying external to the hypertrophied portions and beneath the normal prostate. If such a calculus was beneath the middle lobe, it could be removed through the lateral incision. He had practically never been able to appreciate or remove calculi by suprapubic prostatectomy when they were in that portion of the prostate. Having removed prostate and stone, through an inverted "V" incision, the surgeon was in a position to carry out whatever might be desirable. His present method was, after removing the prostate, to push into the bladder a rubber bag which was then blown up with air or water so as to form a tractor to stop hæmorrhage; a tube in the centre of the bag allowed for drainage. That obviated the need for gauze packing or sutures. But the wound took longer to close, and convalescence was slower.

Causes of Mortality.

Of the immediate causes of death in these cases, the more important were pneumonia and pulmonary embolism. His own mortality-rate, in 1571 cases, was 3·6 per cent. The most serious post-operative complication was embolism which might take place as late as three to six weeks after the operation. It was not known exactly why it occurred, but there was such a risk in all operations below the umbilicus

A careful comparative study by the surgical department at Johns Hopkins Hospital had shown that pulmonary embolism was now more common all over the world than formerly. This was also the view at the Mayo Clinic. Sometimes no lesion was found in the femoral vein, yet in the heart there was a long clot which must have come from it. Possibly posture had something to do with the formation of emboli; certainly sepsis played an important part. Only 8 per cent. of the fatal cases in his series could be attributed to the heart condition. The variation in mortality-rate over 20 years was interesting. At first the operative mortality was 8½ per cent; in the next 66 cases it came down to 5 per cent.; and in the following two years to zero—96 operations without a death. The publication of these results, and the consequent receipt of extreme cases from many places—possibly combined with a little over-confidence—caused the mortality to return to 5 per cent. Again the zero point was reached, and after the war there was another rise. During the last three years, operations including men over 80 years of age, he had had no deaths. It was fair to conclude that the operation per se need not be regarded as a serious one; but in patients of prostatectomy age, any pathological condition might be met with, and there was always necessarily some risk. Not infrequently the vesical orifice was in a condition of fibrosis, especially difficult to remove by the perineal route.

Hypertrophy and Malignancy.

Twenty-two per cent. of men who came to his clinic with symptoms of prostatism had carcinoma, and in many the malignancy was contemporaneous with hypertrophy. Osler had well said that the general practitioner should make himself as adept at examining the prostate per rectum as he was at examining the lungs, and that this examination should be done more frequently. Medical men should be impressed more than they were with what could be gained by early operation in these cases. Too often, by the time the patient reached the urologist the lateral lobes as well as the seminal vesicles were indurated, and there was little hope of a radical cure. In 50 per cent. of cases of carcinoma in his experience there were two lateral hypertrophies and a carcinoma at the back; there seemed, indeed, to be a selective affinity between carcinoma and hypertrophy. Carcinoma, almost in every case, developed in the posterior portion. The cystoscope showed great lobes projecting into the bladder, and the surgeon must not be deceived into supposing that there was present no more than ordinary hypertrophy. He had found that in practically all cases in which there were grounds for suspecting carcinoma, the suspicion proved justified. In suspicious cases the prostate should be exposed, resected, and a frozen section made.

In cases in which the disease had progressed so far that radical operation was impossible, as a rule no operation was needed, because these men were able to urinate. But something had to be done on account of complete retention, a catheter life was apt to prove difficult and painful, and there might be much bleeding. His practice then was to resect the lateral and median portions of the prostate sufficiently to remove the obstruction. He and his colleagues had dealt with about 400 cases in this way, and the majority had continued able to pass water. The procedure had not stayed the onset of the carcinoma, but had given the patients a more comfortable existence than followed simple suprapubic drainage. The perineal route was justified in cases of diverticulum of the posterior urethra which appeared on the surface and the opening of which could be found by means of the cysto-urethroscope. Another condition which urgently required perineal prostatic surgery was the trauma to the posterior urethra, generally at the junction of prostatic and membranous portions, which occurred in fractured pelvis. Recto-urethral fissure also was operable through the perineum. For septicæmic conditions he relied on the intravenous use of arseobenzol or mercurochrome, 25 to 30 c.cm. of a 1 per cent. solution of the latter.

The PRESIDENT thanked Dr. Young for his address, which was illustrated by a large series of lantern slides. There was no discussion.

SECTION OF ANÆSTHETICS.

Mr. R. E. APPERLY, the President, took the chair at the annual general meeting of this Section on May 2nd. After officers had been elected and other business transacted, a paper on

ETHYLENE ANÆSTHESIA

was read by Dr. R. J. CLAUSEN. Ethylene as an anæsthetic had been first mentioned, he said, in 1849 by Thomas Nunnely, a surgeon of Leeds, who had condemned it on several grounds. Its modern use dated from 1923, when Luckhardt, of Chicago, and other transatlantic workers had applied it successfully. It had attained popularity in America and Canada, but not in this country. Dr. H. P. Fairlie, of Glasgow, had, however, had considerable experience, and Sir Francis Shipway and Dr. C. Langton Hewer had both reported favourably on it in 1925. Its formula was C_2H_4; it had no colour but a characteristic and unpleasant smell, part of which might be due to impurities. It was highly inflammable and when mixed with oxygen, air, or nitrous oxide, explosive. It could be used in a McKesson or any other good machine calibrated for nitrous oxide; the oxygen percentage given was theoretically less than with nitrous oxide but actually was unexpectedly large. The cylinders were similar in size but only contained 150 gallons of ethylene as against 200 gallons of nitrous oxide. The valve nozzles had a left-hand thread as a warning of the inflammability of the gas, and therefore required special adaptors in a Boyle's machine; Dr. Clausen preferred the yoke attachment with straight or type 7 valves. He had given 371 administrations, 92 of which had been for dental extraction and the remainder mostly for gynæcological operations. The McKesson apparatus had been employed for practically all. Ages had ranged between zero (represented by five Cæsarean sections) and 84; the longest anæsthesia had lasted 2 hours 25 minutes. Ethylene had proved excellent in pelvic operations in combination with spinal anæsthesia. A few endotracheal applications had been given. The preparation and premedication had followed the ordinary hospital routine; some hypnotic was desirable, and Dr. Clausen recommended gr. 1/6 morphia with gr. 1/100 atropine.

Induction was quick and pleasant, and followed the same technique as with nitrous oxide. It was generally commenced with nearly pure gas, the oxygen percentage being increased slightly after the first few breaths. If the breath were suspended through secondary saturation, pure oxygen would quickly restore it. The time of induction was probably less than with nitrous oxide, and the onset of anæsthesia was quick and sudden with relaxation. The type of anæsthesia was like that produced by nitrous oxide but was deeper and smoother; there was more relaxation and the pulse- and respiration-rates were slower. The oxygen percentage being higher, the colour was deeper, but the signs of anoxæmia were not usually so obvious. The oxygen percentage ranged from fifteen to thirty, the dial showing 10–15 per cent. The consumption of gas averaged about 60 gallons an hour, and of the oxygen about two cubic feet; in hospital this would cost about 3*s.* 3*d.*

Ether had been given as well in nearly all abdominal operations to secure adequate relaxation, but could probably be dispensed with if heavier premedication were used and the induction prolonged. It was more effective with ethylene than with nitrous oxide, and an average of two and a half ounces had been sufficient in a series of operations lasting on an average

82 minutes. It was chiefly useful for debilitated and shocked patients, in the repeated anæsthesias of radium therapy of the uterus, and in hospital dental work.

Recovery from ethylene was nearly as quick as from nitrous oxide, though complete elimination of the gas took much longer. It was succeeded by a long period of analgesia. The patient's condition after a long anæsthesia was strikingly good, and convalescence was equal to that after nitrous oxide. Slight vomiting was common after applications lasting more than a quarter of an hour, but serious sickness was rare, though more frequent than with nitrous oxide. No deaths could be attributed to ethylene, though it had been blamed for the death of one Cæsarean baby with unexpanded lungs.

Its drawbacks were (1) its smell; (2) increased hæmorrhage; (3) risk of fire. The smell could be counteracted by the use of an efficient exhaust pipe; Dr. Clausen used a rubber hose-pipe of about half an inch bore, which could be carried in his case. In hospital a permanent exhaust pipe could be fitted with little trouble. This device produced no ill-effects in the patient, as it only caused a respiratory pressure in the mask of at most half a millimetre of mercury. Another means was a closed circuit with carbon dioxide absorption. Hæmorrhage was not much increased, and some patients bled profusely with other anæsthetics. The risk of fire or explosion was real, and ethylene should not be used near naked lights, cauteries, diathermy, or other sources of heat. Most of the reported accidents seemed to have been due to neglect or to static electricity, a phenomenon rare in this country. There was little risk of explosion with 20 per cent. of oxygen or less. Dr. Clausen only took one precaution, that of putting a little water into the rebreathing bag in order to moisten the mixed gases. To sum up, ethylene might often replace nitrous oxide with benefit, but its drawbacks at present prevented its general use, though it deserved a thorough investigation and trial.

Discussion.

Dr. LANGTON HEWER said that he had found the advantages of ethylene over nitrous oxide to be the deeper relaxation it gave and the higher percentage of oxygen that could be administered. In the laboratory ethylene hardly smelt at all, but when kept for 24 hours it acquired its characteristic acetylene-like smell, which must be due to impurities. If chemists could remove this disadvantage, the use of ethylene would be less unpleasant and might increase. The patient was hardly affected at all. The closed circuit had the drawback that it was difficult to see when the compound in the carbon dioxide filter had become used up, and a rather large container was necessary for a long case. He doubted whether ethylene had any advantages over nitrous oxide with a minimum amount of ether.

Dr. JOSEPH BLOMFIELD had formed a favourable opinion of ethylene from using it on a number of very sick patients in short operations. He had, however, abandoned it because of its detestable smell.

Dr. H. W. FEATHERSTONE asked how long the flexible expiratory tube must be. To move the table towards the window in a modern theatre would introduce complications, and a tube of any length caused back pressure. The smell was the greatest obstacle to anæsthetists who believed in the gas, for it intensified the criticism always levelled at a new method.

Dr. I. W. MAGILL did not regard ethylene as vastly superior to nitrous oxide. He suggested that the exhaust pipe be fitted with a suction motor to obviate back pressure.

Dr. ASHLEY DALY suggested that the death of the baby delivered by Cæsarean section had been probably due to the morphia of the premedication. He objected to a preliminary hypnotic for these operations.

Dr. CLAUSEN, in reply, said that this patient had not had morphia. He used a pipe about five yards long, which led into a corner of the theatre. The increase in back pressure was inconsiderable under ordinary conditions; it was only apt to be at all serious if the patient were straining or coughing or breathing deeply and violently. The smell was chiefly in evidence in dental work, where the exhaust pipe might not be practicable. The percentage purity of the gas was already 99·8, but the manufacturers were experimenting with a view to reducing the smell. Ethylene with a little ether gave better results than nitrous oxide with a fair amount of ether, and there was a definite balance in favour of ethylene.

Reviews and Notices of Books.

MEDICINE IN THE TROPICS.

Recent Advances in Tropical Medicine. Second edition. By Sir LEONARD ROGERS, C.I.E., F.R.C.P., F.R.S., Physician and Lecturer, London School of Tropical Medicine. London: J. and A. Churchill. 1929. Pp. 439. 12*s.* 6*d.*

IN the preface to the first edition of this book Sir Leonard Rogers spoke of the detailed progress in tropical medicine of late years, as opposed to the giant strides of two or three decades ago. The second edition carries us a little further in this gradual advance, but contains no momentous additions. In the new edition a certain amount of material has been omitted to make room for sections on Oroya fever, verruga peruana, helminthic infections, granuloma inguinale, and climatic bubo; additions have also been made to the excellent illustrations. The section on Oroya fever and verruga peruana gives an interesting summary of H. Noguchi's research which has established the identical origin of the two diseases. Working with the *Bartonella bacilliformis* from the blood of a Peruvian case of Oroya fever, he found that he was able to produce both intermittent fever of the Oroya type by intravenous injection, and skin nodules typical of verruga by intradermal inoculation. He found that transmission occurred by the bite of a tick, which explains a local belief that the disease is only contracted by those sleeping in affected areas, and cannot be acquired during a visit in the daytime. No satisfactory treatment of the two modifications of the disease has been found, but salvarsan appears to be of benefit. Sir Leonard Rogers deals with the common tropical diseases in the way which is most likely to be of value to the practitioner who has to handle them—that is to say, he gives prominence to treatment and to those practical points in diagnosis which can be distinguished by an isolated physician in the tropics. Detailed descriptions of laboratory technique are avoided.

The Care of Children in the Tropics. By ERIC C. SPAAR, M.D., M.R.C.P., Physician, General Hospital, Colombo. London: Baillière, Tindall and Cox. 1930. Pp. 265. 7*s.* 6*d.*

THIS book is intended for the use of mothers and young practitioners, and comprises a well-arranged and readable account of the essentials of pædiatrics, with special information on problems peculiar to tropical climates. A chapter which will be particularly helpful to mothers who are unfamiliar with such climates is one on nursery hygiene, containing details of the management both of the baby and the ayah. Considerable attention is devoted to infant feeding, and due stress is laid on the additional importance of breast-feeding under unfavourable hygienic and climatic conditions. In artificial feeding the relative merits of fresh and dried milks have to be considered on quite a different basis to that which arises in England, and, except under special circumstances, the use of dried milks is here advocated. This book

should be a wise investment for any parent who is faced with the problem of bringing up children in a hot country.

Epidemiology and Control of Malaria in Palestine. By ISRAEL J. KLIGLER, Director, Department of Hygiene, Hebrew University, Jerusalem. Chicago: University of Chicago Press. 1930. Pp. 240. 22*s.* 6*d.*

THIS is an extremely well-planned piece of work which is a testimony to the care and industry of Dr. Kligler. Although primarily of local interest, the book contains evidence of extensive personal observation and may be widely read on that account. The chief carrier of malaria in Palestine is known as *Anopheles elutus*, and all the efforts designed to keep it under control are adequately reviewed in this book.

Malarial Nephritis. Epidemiological and Clinical Notes on Malaria, Blackwater Fever, Albuminuria, and Nephritis in the Interior of British Guiana Based on Seven Years' Continual Observation. By GEORGE GIGLIOLI, M.D. Italy, D.T.M. & H. Eng., Chief Medical Officer to the Demerara Bauxite Co., Ltd., British Guiana. London: J. and A. Churchill. 1930. Pp. 164. 8*s.* 6*d.*

THE high incidence and severity of nephritis in the tropics, especially in South America, has given rise to considerable concern and speculation. It has formed the subject of several inquiries and has been widely discussed in recent papers. Dr. George Giglioli, who is well known for his intensive and accurate work at Mackenzie City, has done well to combine in this small book his views on the relation of chronic malaria to nephritis together with his observations on the epidemiology of malaria and blackwater fever in British Guiana. Chronic nephritis, he finds, is not associated with any particular species of malaria parasite. Albuminuria was present in 25 per cent. of 550 cases examined. In benign tertian and quartan malaria the frequency of albuminuria increases with the duration of the infection and its tendency to relapse. In most old-standing cases of malarial nephritis the search for parasites in the blood may be negative. During seven years' observation in British Guiana 56 cases of blackwater fever were observed by Dr. Giglioli, and of these 33 occurred in children below 15 years of age.

The Mosquitoes of North America. By R. MATHESON, Professor of Entomology, New York State College of Agriculture, Cornell University. London: Baillière, Tindall and Cox. 1930. Pp. 268. 25*s.*

THIS is a modest but practical book. The author acknowledges his indebtedness to Howard, Dyar, and Knab for their masterly work on the mosquitoes of North and Central America. His own work has the merit of brevity and clearness. The keys of genera are well arranged and the descriptions of species adequate. Only eight species of anophelines are known from North America and several of these are rare, local, or confined to the more southern parts of the United States. Of culicinæ nearly 120 species are treated and described. The volume closes with nine plates illustrating the hypopygia as a means of differentiation. There are also numerous outline figures of the larvæ and a good index. Altogether a most useful work for students.

STATISTICAL METHODS FOR RESEARCH WORKERS.

By R. A. FISHER, Sc.D., F.R.S. Third edition, revised and enlarged. London: Oliver and Boyd. Pp. 383. 15*s.*

THE statistical problems which nowadays present themselves to the laboratory worker tend to increase in number rapidly, so that it is not surprising that Dr. Fisher's monograph should have reached a third edition within five years. The intention is that use should be made of the book without entering into the mathematical theory of statistical methods, and the methods are here presented in the form of practical procedures, appropriate to the data with which the pieces of research work are actually concerned. None the less a very considerable familiarity with mathematical technique is required for the comprehension of the teaching. Few individual workers in the solution of medical problems are likely to possess the necessary equipment, but it is to the advanced biologist that the manual is directed. He will find the work valuable and the tables at the end to afford convenient assistance.

PATHOGENIC MICRO-ORGANISMS.

Ninth edition. By WILLIAM HALLOCK PARK, M.D., Professor of Bacteriology and Hygiene, University and Bellevue Hospital Medical College, and Director of the Bureau of Laboratories of the Department of Health, New York City; and ANNA WESSELS WILLIAMS, M.D., and CHARLES KRUMWIEDE, Asst. Directors of the Bureau. London: Baillière, Tindall and Cox. 1929. Pp. 819. 30*s.*

THE new edition of this well-known American text-book has been extensively revised. Its matter has been rearranged so that the grouping of the different micro-organisms conforms more closely to the classification adopted by the Society of American Bacteriologists, whose nomenclature has been adopted, though not to the exclusion of the older and more familiar terms. The chapters on the pyogenic cocci, the paratyphoid bacilli and the pneumococci have been practically rewritten. The consideration of the salmonellas is rather scanty and hardly up to the standard expected in this country, whilst a serious omission is the absence of discussion of somatic and flagellar antigens which makes the chapter upon agglutination decidedly out of date. A number of minor errors deserve attention—e.g., the description of the *Streptococcus fæcalis* as a "viridans" organism on page 317; the quantity of serum to be injected intracutaneously in the Schultz-Charlton test is given as 1·0 c.cm. instead of 0·1 c.cm. (p. 329); and Nakayama's description of the process of obtaining fresh active leucocytes (p. 322) is incomprehensible. No mention is made anywhere of rheumatic fever. The book is, on the whole, well balanced and in spite of the increasing collaboration which has gone to its making it preserves much of that personal touch which has contributed so largely to its success.

CLINICAL ATLAS OF BLOOD DISEASES.

By A. PINEY, M.D., M.R.C.P., Research Pathologist, Cancer Hospital, London; and STANLEY WYARD, M.D., M.R.C.P., Physician, Bolingbroke Hospital. London: J. and A. Churchill. 1930. Pp. 99. 12*s.* 6*d.*

THE value of atlases of the blood is open to question. Given an acquaintance with the general principles of pathology and more particularly of the embryology and morphology of the blood, it is possible to make some sort of an intelligent deduction as to the type of blood picture to be expected in any particular pathological condition. For those, however, who have not mastered, or have no aptitude for, general principles, pictorial representation undoubtedly has its value. Thanks to the skill of Mr. J. R. Ford the present volume contains some of the best pictures of blood cells, both normal and abnormal, ever published. The accompanying text is skilfully arranged so as to give in the shortest possible space the outline of the pathology and treatment of the conditions considered. In future issues the authors might place a short descriptive caption below all instead of only below some of the plates.

The book is essentially one for the learner, and could hardly be bettered.

A MANUAL OF ZOOLOGY.

Sixth edition. By L. A. BORRADAILE, Sc.D., Fellow and Tutor of Selwyn College, Cambridge, and Lecturer in Zoology. London: Humphrey Milford, Oxford University Press. 1930. Pp. 683. 16*s*.

THIS book has primarily been written for university students starting zoology. It is deceptively small and contains an immense amount of reading matter with numerous illustrations. The first chapter is an introduction to the living organism in which the author endeavours to give, in an elementary form, the principles of metabolism and the biochemistry of life. Differences between the animal and vegetable kingdoms are also dealt with. The next four chapters are devoted to the anatomy, histology, and physiology of the frog. The subjects are dealt with simultaneously and in some detail, yet very concisely. In fact, the matter is so condensed that a beginner might hardly be able to cope with the material put before him. The protozoa are then described; the amœba, paramecium, and vorticella receiving the most attention. There follows a chapter on protozoa pathogenic to man, the transmitting agents being briefly mentioned. The various phyla of the metazoa are then considered systematically, representative members being described in each case. In connexion with the nematodes, parasitism receives special consideration. Following upon the systematic zoology is an introduction to embryology, a classification of the animal kingdom, and an introduction to evolution. The final chapter is an introduction to animal ecology. The book concludes with an appendix indicating a course of practical training.

The book should be of value to university students doing first and even second year zoology. In particular it should appeal to medical students, for references to pathogenicity are abundant.

THE FEMALE SEX HORMONE.

By R. T. FRANK, A.M., M.D., Gynecologist to Mount Sinai Hospital, New York. London: Baillière, Tindall and Cox. With 86 figures in the text. Pp. 321. 25*s*.

THIS monograph differs from another upon the same subject by A. S. Parkes recently reviewed in THE LANCET mainly because the author is primarily interested in the clinical aspects of gynæcology: an attitude which will commend itself to many of our readers. Unfortunately, however, the clinical side is also in many respects the more elusive, depending as it often does upon subjective evidence, and therefore needing even greater care and caution in its presentation. These virtues are not particularly noticeable in this monograph, either in the first part dealing with the biology, pharmacology, and chemistry, or in the second part concerning clinical investigations based on Dr. Frank's test for the hormone in the blood; many statements are made with a confidence which the reader may not share. Considering his 25 years of laboratory and clinical research Dr. Frank's own work may reasonably be expected to fill a considerable part of this volume; but the personal element may seem a little too prominent for a book which has the external appearance of a general survey of the subject. Statements based upon personal experience only, and even contrary to generally accepted opinion, are put forward without reference to opposing views. For example, the criticism of the water-soluble forms of the female sex hormone that "the rapid deterioration of such solutions bars their effective clinical use" is mainly based upon the author's tests of a number of supposedly active watery preparations, no evidence being given that the batch of material tested was active at the outset. But among the results of assays presented with admirable candour by Dr. Frank there is no example of a preparation found to be highly potent which showed rapid subsequent deterioration. The author's comment upon the Aschheim-Zondek test for pregnancy—that the test is unworkable since the immature mice die long before the completion of the test—has been disproved by several investigations during the past year. Such statements detract from the value of the book, which is to be regretted, since Dr. Frank's experience permits him to present an interesting case for the use of his own test for the diagnosis of pregnancy and for certain ovarian disorders, based upon the estimation of the amount of œstrus-producing hormone in the patient's blood. This section occupies about 120 pages compared with 149 pages dealing with biology, pharmacology, and chemistry. In his foreword the author comments on "this much desired and sought for hormone, which is bound to relieve many of the ills from which women now suffer." Is it really certain that administration of the œstrus-producing hormone will have this result on human patients? Clinical investigations have as yet been relatively few, and though encouraging results have been reported with admittedly active preparations, it seems doubtful whether they justify such optimism.

RHEUMATISM.

A Study of its Nature and Cure. By CHARLES E. SUNDELL, M.D., M.R.C.P. Lond., Senior Physician to the Seamen's Hospital, Greenwich; Consulting Physician to the Evelina Hospital for Children. London: Southern Libraries, Ltd. Pp. 88. 4*s*. 6*d*.

THERE is little that is new, but much that is useful in this little book; it has the merit of being short and easy to read. Several paragraphs are devoted to the diagnosis and treatment of chronic backache, a common and depressing complaint which at present does not receive sufficient attention. In the early part of the work the author defines what he considers to be the fundamental abnormalities in rheumatism and these defects he attacks logically and thoroughly in the section on treatment.

COLPORRHAPHY AND RHEUMATISM.

Recent Work on Colporrhaphy, Rheumatism, and Coli Bacilluria. Second edition. By E. HESKETH ROBERTS, F.R.C.S. Edin., M.D., B.S. Lond., Gynæcological Surgeon, St. John's Hospital, Lewisham. London: H. K. Lewis and Co., Ltd. 1930. Pp. 32. 3*s*. 6*d*.

THE first part of this little book deals with recent work on colporrhaphy, and will be of real value to those who perform this operation. The method of procedure is discussed in detail and is clearly illustrated by numerous diagrams. The second part of the book is concerned with rheumatism and its relation to the perineal conditions for which colporrhaphy is performed, and coliform bacilluria. This section is too indefinite to be useful; an ill-defined disease is blamed for a vague collection of symptoms. Contrary to the author's belief, coliform bacilluria is a recognised source of infection in chronic rheumatism.

X RAY INTERPRETATION.

Elements d'interprétation radioscopique et radiographique des poumons. By Dr. LÉON SCHEKTER (de Boulogne-sur-Mer). Paris: Gaston Doin et Cie. 1930. Pp. 94. Fr.12.

IN this little book Dr. Schekter gives a brief description of X ray shadows produced by the different diseases of the lungs. It is now recognised that considerable disease and even a large tumour may exist in the lung without any physical signs, though the lesion is quite obvious on X ray examination. The interpretation of X ray shadows is, however, a matter of great difficulty, and it is not uncommon to find a patient condemned as consumptive because of shadows which are within normal limits. It is, therefore, as dangerous to overrate as to underrate the value of X ray examination.

This volume will be found useful by the practitioner who has not the time to study the larger text-books on the subject, for though the descriptions of the various conditions are very brief, there are many references to authorities where more detail can be found on any special point.

THE LANCET.

LONDON: SATURDAY, MAY 10, 1930.

PRESENT-DAY EFFECTS OF WAR STRAIN.

COMPLAINT is made by the writer of a letter in the *Daily News* that, when what he calls some wretched derelict of the war is brought before a judge and pleads a war wound or strain of war as an excuse for his trouble, a common judicial retort is that the war is a long way off and such excuses no longer serve. Such incidents do occasionally occur, and illustrate the need, referred to in a recent leading article, of the psychological examination of offenders, for at present the only course open to a magistrate who takes the plea seriously appears to be that of remanding the prisoner to await a report from the prison doctor. Those engaged in the treatment of war neurasthenics often meet with men who, after having fallen into the hands of the police, expressed gratitude for the way they had been understood and handled, and it is gratifying to know that both police and prison officials are ready to give help when they recognise that help is needed; but the cases under discussion indicate the absence of regular machinery to ensure that recognition, and the summary dismissal of the defendant's plea may not only involve injustice but seriously and detrimentally affect a genuine sufferer, whilst even the prison doctor to whom he might be referred may not possess the knowledge of psycho-pathology necessary for the understanding of his mental state.

Setting aside for the time, however, the problem of psychological assistance in court procedure, we may ask whether the mental results of war stress are now a closed book or whether any considerable number of men are still suffering from them. There are still thousands of men drawing pensions for these results, and the Ministry of Pensions maintains homes where the worst cases can find a refuge, but apart from these recognised cases it is impossible to do more than guess at the prevalence and effect of disability due to war stress. Of its victims the more fortunate have overcome their difficulties and found satisfaction in life, others are holding inferior positions through inefficiency, and some have become hopeless derelicts. Employers soon became chary of employing men who had been invalided for neurasthenia, and their attitude is understandable when we realise that under that vague diagnosis are hidden changes in the personality that render the sufferer emotionally unstable and unreliable as a worker. Public attention and sympathy are no longer directed towards the neurasthenic ex-Service man, and it is to be feared that he often meets the fate that comes upon victims of a disorder likely to be described as neurotic and offering no opportunity to ordinary therapy.

Reports of suicides often mention changes of behaviour attributed to war service, though definite medical evidence is rarely sought—perhaps because such changes are still felt to be outside the sphere of clinical medicine; and only by reading between the lines is it sometimes possible to form an opinion as to the nature of the case. Those who pay special attention to the psychoneuroses certainly still meet with patients whose symptoms are related to war experience, and it has been claimed that it is possible to demonstrate the process of suppression, characteristic of the war cases, as still active in ex-Service men who present nervous symptoms, whether supposed or not to be due to war strain. There is, then, no doubt that the nervous sufferer from the late war is still with us. The fading away of emotional public interest in his troubles is not entirely to be regretted, for deteriorative character changes often led a man to take advantage of the emotional appeal rather than coöperate in efforts at rehabilitation. He who complained least often suffered most, for, in spite of a common belief to the contrary, the patient suffering from mental troubles, such as marked many of the war cases, tends to keep them to himself. It is to be hoped that emotional interest will not be replaced by the neglect that in the past was associated with ignorance of psycho-pathology; indeed, there is less danger of that neglect for the very reason that the war itself gave a great stimulus to the study of the minor psychoses. We know now that the war cases differed only superficially from cases, equally serious, that occur in civil life; apart from the help given him by the Ministry of Pensions, the war sufferer must stand or fall with his fellows who have never had the right to claim that help. The plea of war strain in our courts thus becomes only a special example of the need for an organised method by which all relevant information about an offender should be placed at the service of those called upon to pronounce judgment upon him.

END OF THE POOR-LAW IN SCOTLAND.

ON Thursday next Scotland's particular Local Government Act comes into force and the poor-law functions of parish councils pass over to the town councils of the large burghs. The zeal and care with which the parish councils have discharged the duties of their last year in office is commended in the first report which has been put out by the new Scottish Department of Health.[1] One of their chief problems of late years has been the relief of able-bodied unemployed, which still calls for anxious consideration of individual cases. In 1921 parish councils were empowered to grant relief to able-bodies persons who were unable to find employment. This was intended as a temporary measure, but the difficulties which have arisen out of it make the remedy almost as unsatisfactory as the problem. Later Acts which empowered the councils to coöperate with other local authorities in providing relief work for these men, or to assist them to emigrate with their families, can only be of value in a few cases while the number of able-bodied unemployed remains so large. Unconditional financial relief, although tending to preserve the standard of health, may lead to a habit of idleness which is injurious alike to the man's physique and his morale. The refusal of all relief except residence in a poor-law institution is not a satisfactory measure, since if relief is accepted the man is no longer in a position to seek work, and if he is genuinely unable to find employment refusal to accept indoor relief will leave him destitute. If relief is refused to a man because of prolonged unemployment, but granted to his family, the result is that he shares, as a rule, in relief which was not intended to suffice for a whole household. Again, a man who has made serious attempts to find work resents being forced to share institutional life with those who have been refused outdoor relief on the grounds of bad character. In Glasgow during the past year employment

[1] First Annual Report (1929) of the Department of Health for Scotland. Cmd. 3529. H.M. Stat. Office. 1930. Pp. 220. 3*s.* 6*d*

was found for a large number of men on a new mental defective institution, the aliment which they would otherwise have received as outdoor relief being contributed to the District Board of Control which was erecting the building. Men unemployable in the present state of the labour market, either through mental or physical defect or through depraved habits, represent an even more serious difficulty. It is customary to offer only indoor relief to these cases, but their presence in the institution is a source of discomfort to the other inmates, and certainly does not simplify administration. It has been suggested that labour colonies are required for the reform or training of such persons.

Unemployment in Scotland remains high and has increased since 1928; during 1929 the average number of unemployed represented 12·3 per cent. of the insured population. In 1927 and 1928 the corresponding figures were 10·1 and 11·6 per cent. respectively, and there has been a real as well as a relative increase in the numbers. In the coal-mining industry there was improvement as compared with 1928, but in shipbuilding unemployment remained high; in marine engineering unemployment was below the general average. Certain industrial areas show marked improvement, Clydebank, Greenock, and Port Glasgow being among them. Vagrancy has increased of late years owing to movement about the country of men in search of work. Applications for relief are made to inspectors more especially along the main roads, so that the burden on parish rates is unequally distributed. Often there is no poor-law institution for 30 miles or more, and construction of shelter houses may become necessary. Unfortunately a taste for tramping appears to grow on those who pursue it indefinitely; many able-bodied young men appear to prefer the life of a tramp, picking up occasional odd jobs, to the monotony of steady employment. GEORGE BORROW and W. H. DAVIES in their defences of vagrancy might have spared more sympathy for the mournful lot of the ratepayer, who, besides drudging through the daily round, must maintain the road which the tramp wears out, and if necessary must subsidise the tramp as well. Not uncommonly, in a Scottish parish where an arrangement is made by the council with a householder for sheltering and feeding vagrants, the tramp will ask for another egg and offer to pay for it himself. One of the tasks of the new authorities will be the provision of better institutional accommodation. At present it is not uncommon in Scotland to find acutely sick persons, chronic invalids, senile poor, young children, able-bodied poor, vagrants, mental defectives, and lunatics all in the same institution; the disadvantages of such a system, especially for young children, cannot be too strongly emphasised. The imminence of local government reform has deterred parish councils from undertaking extensive building during the past few years, but the new régime will call for the provision of more satisfactory accommodation.

CALCIUM AND PHOSPHORUS.

KNOWLEDGE of the part played by calcium and phosphorus in the metabolism of the human body has greatly increased during the last ten years and the practical value of this knowledge is beginning to be recognised. But most medical men still have but a dim appreciation of what has been ascertained, while a few have been able to grasp its value in one direction or another. Where new territories are being explored and defined, it is difficult for those who are not engaged in the work, difficult even for those engaged in it, to see its significance and to estimate its value to mankind. Our readers, therefore, will welcome the full and careful review in Dr. DONALD HUNTER'S Goulstonian lectures, of which the third and last appears in THE LANCET this week, and especially the indications he has given of the practical value to clinical medicine of the recently acquired knowledge. On the metabolic processes that concern calcium and phosphorus depend the efficient formation of the bony structures of the skeleton, and that balance of the ions in the body which controls the acid-base reaction of tissues and fluids, the mechanism of the heart-beat, the contractility of plain and striped muscle, the activity of neuromuscular junctions and synapses, and the irritability of muscle and nerve. That the metabolic processes that concern calcium and phosphorus should be correctly performed depends on the ingestion of these elements in sufficient quantities, on their absorption by the digestive processes, on their storage in the skeleton so that they may be readily available when required, and on their presence in the tissues and body fluids in the necessary concentrations and in the necessary physical forms so that they may be available for the biological needs of the tissues and organs. These manifold requirements and functions depend, also, on the integrity of a mechanism in which an accessory food factor, vitamin D, the internal secretion of the parathyroid glands, and an enzyme called phosphatase, play their parts. Phosphorus functions in the storage and utilisation of carbohydrates, and since calcium is stored in the bones as calcium phosphate and phosphorus must be set free with calcium when the stores of the latter are drawn upon, phosphorus metabolism is as important as that of calcium, and the one cannot well be considered apart from the other. It is a long chain of cause and effect. Studies of this nature, whether in human beings or in experimental animals, are necessarily complicated and difficult. Much information is obtained by ascertaining the amount of calcium and of phosphorus in the blood, but in view of the enormous capacity of the skeleton for storage such estimations are indicative merely of the quantity of these elements available for the tissues generally; estimations of their intake and output over a considerable number of days are needed before the loss or gain to the body as a whole can be deduced. Part only of the calcium in the blood is diffusible and able to pass into the tissues and tissue fluids, and of this diffusible calcium a part only is ionised and available immediately for biological processes. The methods for the estimation of these different fractions are not yet satisfactory, and the estimation of the total calcium of the serum, which is the method of study in general use, does not necessarily give the facts that are required. Improved methods of blood analysis may be expected to lead to important further advances. Dr. HUNTER shows clearly that histological study of the bones is required in addition to biochemical study before the disturbances of calcium and phosphorus metabolism that occur in disease can be accurately gauged. He has had the help of Prof. H. M. TURNBULL in the minute examination of bony structures, and their results are good evidence of the productiveness of such coöperation.

Of the applications to clinical medicine none is so dramatic as the recognition of the effect of hyperactivity of the parathyroid glands on the skeleton. The isolation from the parathyroid glands by J. B. COLLIP of a substance that produces on injection a rise of calcium in the serum with increased excretion by the kidney, and the recognition by HUNTER and AUB

that injections of this parathyroid extract cause a loss of calcium from the bones, are important steps in deciding that in certain cases of generalised osteitis fibrosa the diminished density of the bones, the high calcium content of the serum, and the increased calcium excretion point with certainty to a lesion of the parathyroid glands. A number of cases have been recorded in which an incision in the neck has revealed a parathyroid tumour, after removal of which the patient at once improved, the calcium content of the serum fell, and the bones became more dense. In exophthalmic goitre the density of bone is diminished and the excretion of calcium greatly increased, but in these cases the level of calcium in the blood does not rise—why we do not yet know. Prof. TURNBULL's observations on the histology of the long bones make it clear that both in exophthalmic goitre and in hyperactivity of the parathyroid the diminished density of the bone is due to lacunar resorption by osteoclasts and is quite distinct from the diminished density seen in rickets and osteomalacia in which less calcium is laid down in the osteoid tissue. In striking contrast to the condition of hyper-parathyroidism is that seen when the parathyroid glands have been partially removed or damaged during the operation of thyroidectomy. Tetany may then result, associated with low calcium and high phosphorus contents of the blood, and can be relieved by the injection of Collip's parathyroid extract. Tetany may also occur in osteomalacia and some cases of rickets, where the calcium content of the serum is low; but in these conditions it is not advisable to inject parathyroid extract, for this would cause withdrawal of calcium from the bones, which are already poor in calcium salts. Instead the underlying disturbance must be treated, when the calcium content of the serum will rise and the tetany will be relieved. In rickets and osteomalacia the changes in the minute structure of the bones have long been known to be similar, but it is only recently that many workers in many lands have contributed to show that in both the changes are due to the same cause—namely, a deficiency of vitamin D—and that the ingestion of irradiated ergosterol or exposure to sunlight can cure both conditions. In both the phosphorus content of the plasma is low; in osteomalacia the calcium content of the serum is also low and tetany is common; but in rickets the calcium content may be normal and tetany is not common, being only seen in those cases in which the calcium content also is low. In renal rickets the phosphorus content of the plasma is raised and the calcium content lowered, probably as a secondary result of the high phosphorus content, and tetany is frequent.

Estimations of the calcium and phosphorus content of the blood have, therefore, considerable value in diagnosis, and Dr. HUNTER has included in his third lecture a valuable table showing the results of his estimations in typical cases. He discusses other diseases of bone, and indicates how estimations of the phosphatase content of the plasma may lead to important advances. Little is known of the ætiology of osteitis deformans, but H. D. KAY has shown that phosphatase is always in excess in the plasma in this disease. AUB, HUNTER, and others have shown that lead, mercury, arsenic, silver, and radium follow calcium very closely in their behaviour, both as to storage in the bones and elimination. This experience has already been applied in the treatment of lead poisoning and should help us to understand the mechanism of metallic poisoning in general and how to deal with it. Stiff-sickness of cattle is associated with abnormal development of the skeleton, and the investigations of THEILER have shown it to be an osteomalacia of the low-phosphorus type, curable by the addition of phosphates to the diet; similarly, milk-fever of cows is associated with a low calcium content of the serum and can be successfully treated by calcium injections. Accuracy of knowledge leads surely to success in treatment, and Dr. HUNTER's comments on the disappointing results of the administration of calcium in disease deserve the attention of clinicians. The stores of calcium in the body are large and it is usually, he says, the regulating mechanism that is at fault, not the supply. From this it follows that the use of cod-liver oil, ultra-violet light, irradiated ergosterol, parathyroid and thyroid extract may have greater value than the administration of calcium. These are but examples of the way in which our increasing knowledge of calcium and phosphorus metabolism may be applied in human and veterinary medicine, curative and preventive. They illustrate well the progress which is made when the clinician invokes the aid of biochemistry and of pathology and applies their methods to the solution of his problems.

Annotations.

"Ne quid nimis."

WELFARE OF THE BLIND.

THE eighth report of the Advisory Committee on the Welfare of the Blind [1] follows on the lines of its predecessors. According to the latest returns there are 20,149 registered blind persons between the ages of 50 and 70 in England and Wales, and 86 per cent. of these are in receipt of pensions provided for in the Blind Persons Act of 1920 at a cost of £437,900 per annum. The committee thinks the reduction of the age limit from 50 to 40 would be fully justified, but they do not consider how this suggestion, if carried out, would affect those of the blind who have been trained for remunerative employment at an earlier age. Schemes for promoting the welfare of the blind have now been adopted and put into operation by all the 146 local authorities concerned under the Act of 1920, at a cost of £326,799 (1928–29), about one-third of this sum being allocated to assistance to unemployable blind on whom between two and three times as much was spent as was the case two years before. Most of this money has been distributed through voluntary agencies, who have also received direct grants from the Ministry of Health to the extent of £120,000 (1928–29). With regard to the future, the Local Government Act of 1929 changes the system of Government grants, but the committee sees no reason to fear that the amount available for assistance to the blind will be less than heretofore. Indeed, it is hoped that the Act, as finally passed, will considerably strengthen the position of voluntary agencies.

The total number of the registered blind in England and Wales in 1929 was 52,727. Infantile blindness accounts for only a small proportion of this total. The number of registered blind under the age of 5 was 258, or 0·5 per cent. of the total of all ages. We suggest that this figure is wholly unreliable as representing the actual proportion of infantile blindness, and that the vast majority of blind infants are not registered as blind until they become inmates of a blind school after the age of 5. The main causes of infantile blindness are ophthalmia neonatorum, congenital syphilis, and various congenital conditions, including congenital cataract. In an examination of 250 pupils and workers at the Swiss Cottage Blind School in 1927 it was found that out of 180 who had a degree of blindness coming under the definition accepted by the Ministry of Health, as many as 102

[1] H.M. Stationery Office. 1930. Pp. 34. 6*d*.

owed their blindness either to ophthalmia neonatorum or to congenital malformations, including cataract, all of whom must have been blind within the first six months of life.[2] That over a third of the cases of blindness dating from infancy in the whole of England and Wales should be collected at a single institution in London, which is by no means unique, is not at all likely, and we should like to be told exactly how the registration of the blind is effected. It may be added that previous reports of the same committee in 1926 and 1928 have contained similar figures of the proportion of the blind under 5 years old, and in criticising both these reports we had to make exactly the same complaint. The 1928 report also contained figures showing that the percentage of the blind who became blind under the age of 1 year compared to the total number of blind was 17·4 in the year 1927—a fact which is itself a sufficient refutation of the percentage of 0·5 for the proportion of blind existing at that age; for although the proportion of blind from ophthalmia neonatorum has been decreasing to some extent of late years the decrease has not been phenomenal to such an extent.

We regret to observe that in this report there is no reference to the partially blind children who, being too blind to benefit by education in ordinary schools and yet not blind enough to qualify for the special privileges conferred on those termed blind by a somewhat arbitrary standard, are at present apt to fall between two stools. In 1926 the committee expressed the hope that "it would be possible for the Board of Education to proceed with their full programme for the development of extended facilities for the education of this class." In 1928 the report commends the same problem to voluntary enterprise, but as yet we know of no progress in either direction.

In the past the reports of the committee have been largely devoted to the methods of training the blind in remunerative employment. The present one lays stress on the more numerous class of unemployables, in whose interest they have issued a special report to the Minister containing recommendations for financial and general betterment.

RESEARCH INTO BREWING.

FOR many centuries malting and brewing were empirical arts, but in later years these industries, in common with others of long standing, have adopted scientific principles for the methods underlying their practice. The nature of certain investigations carried out by the Institute of Brewing, and still in progress, is described in a memorandum recently issued by the Institute, and from this document it is evident that the various researches are of considerable magnitude, and well meriting the free assistance that is being given to their conduct by members of agricultural institutes and by industrial firms in this country and elsewhere. The work includes the development of new varieties of barley, the investigation of different agricultural conditions such as manuring, the breeding, manuring, drying and packing of hops, methods for overcoming the attack of "downy mildew," and the determination of antiseptic value. In connexion with yeast the work has been mainly directed to the assimilation of various nitrogenous materials by this fungus, whilst experiments on its nutrition are still in progress. Many interesting and valuable results have already been obtained, and whilst the knowledge gained will be of value to the brewing industry the inquiries are of such a fundamental nature that they cannot fail to be of service to the community at large. Pharmacology may also profit, for barley and yeast are the raw materials from which valuable medicaments such as malt extract and nucleic acid are derived. Moreover, the use of hops was a prominent feature in old pharmacopœias.

[2] Thompson, A. Hugh: THE LANCET, 1927, i., 1075.

MEDICAL ANNUALS.

THE *Medical Annual*[1] suffered the loss of its founder and first editor, Dr. Percy Roberts Wilde, in April of last year. The success of his scheme to help the general practitioner to keep up to date must have gratified Dr. Wilde, for since he initiated the first issue in 1882 the annual has grown at first in size and then in prestige until it has become almost indispensable. In 1905 its format was altered, and since then it has not been allowed to expand. The task of editing a summary of current medical advances entails nice judgment and great labour, and though of late years Dr. Wilde had relinquished much of the responsibility, he continued until his death to take a share in the preparation of the *Medical Annual*. The 1930 volume contains articles by recognised authorities on the research and practical experiment of the year, and the editors, Dr. Carey F. Coombs and Mr. A. Rendle Short, review the contents in their introduction. An article by Dr. Ivor J. Davies on the liver treatment of pernicious anæmia deals at length with prognosis, which can, of course, be estimated better as the years pass. One of the secondary effects of the treatment is a rise in the price of raw liver, so that patients find difficulty in obtaining a steady supply. This depends partly on the promiscuous liver treatment of all manner of ailments, a craze which requires correction if cases of pernicious anæmia are to enjoy the benefit of this diet. The value of other foods in this disease, such as kidneys, apricots, and peaches are mentioned, but it is emphasised that these, like liver, only stimulate the development of red cells and have no effect on the underlying pathological process, whatever it may be. The clinical experiments devised by Dr. W. B. Castle to elucidate this process are mentioned in this excellent survey. The intramuscular injection of liver extract as a treatment of high blood pressure is discussed in an article by Dr. A. G. Gibson; the method has been examined by Althausen, Kerr, and Burnett, and appears to cause a temporary fall in pressure, without, it is claimed, any adverse effects. The rationale of the treatment is not discussed. An interesting but depressing section is that on pain in the lower part of the back by Prof. E. W. Hey Groves. After shattering the old theory of pelvic disease, grudgingly conceding arthritis, doubting the existence of sacro-iliac dislocation apart from severe trauma, and moodily holding the scales for strain of the sacro-iliac joint as a cause, Prof. Hey Groves confirms the obscurity of the outlook by a warning against acceptance of anatomical deformity, radiographically discovered, as the basis of any symptom-complex. There is a helpful paragraph on the differential diagnosis of sacro-iliac and lumbo-sacral strains and sprains, especially useful in view of Mr. Riches's experience that the former alone react favourably to manipulation,[2] and a short reference to the work of C. E. Ayers on lumbo-sacral backache due to compression of the fifth lumbar nerve. The paragraph on the treatment of these conditions is brief and pessimistic; the article is well illustrated with X ray plates and a diagram of the fifth lumbar root. A section on the treatment of burns and scalds, by Sir William I. Wheeler, gives an excellent description of the tannic acid method, which is now extensively used for severe burns. Application by means of an atomiser is recommended. It will be remembered that spraying is repeated until a leathery coagulum is formed which protects the injured surface and prevents toxic absorption; the coagulum begins to separate after about a fortnight, and leaves either a healed epidermis or a healthy granulating surface. Sepsis occurring beneath the coagulum sometimes gives rise to trouble, and may require the removal of a part with scissors to allow of the escape of pus. A warning is given against the use of vaseline or moist

[1] Bristol: John Wright and Sons, Ltd.; London: Simpkin Marshall, Ltd. 1930. Pp. 650. 20s.

[2] THE LANCET, May 3rd, p. 957.

dressings to remove the coagulum, lest the toxin previously imprisoned should be released by solution. The annual is arranged alphabetically and is excellently illustrated; the decision to keep it to a size convenient to handle has had the further advantage of ensuring a careful selection of material and its limitation to what is of practical interest.

L'Année Médical Pratique,[3] which attempts to fulfil the same functions in France, is a more modest volume, and the absence of illustrations other than the most diagrammatic make it less attractive. It also provides a survey of the year's work by various authorities. The sections are on the whole briefer, and view the subjects from a different angle. For example, liver treatment of anæmia associated with nephritis is discussed; the view is put forward by C. Lian that the anæmia is much improved in these cases by liver, and that the nitrogen retention, far from being augmented, is decreased. In a case described by Marcel Labbé, however, though the blood count was increased, the blood-urea also continued to rise. The articles are perhaps too brief to give a comprehensive survey of the year's advances; the editors might consider enlargement of the volume as a possibility in the future. Both the English and French annual include a list of preparations, chiefly proprietary, which have come into use during the past year, with a short description of their composition and advantages.

IMMUNISATION AGAINST FILTRABLE VIRUSES.

MUCH attention is now being paid to prophylactic immunisation against those disease agents which we group together under the term "filtrable viruses." Not very long ago it was accepted almost as axiomatic that no immunity could be obtained against these viruses without the production of lesions, but recent research has shown that this is not true. The independent observations of Vallée, Carré, and Rinjard in France, and of the British Foot and Mouth Committee, show that if the virus of foot-and-mouth disease is inactivated with low concentrations of formalin it still retains the power of conferring immunity, whereas its antigenic power is entirely lost on inactivation by heat. This principle has since been applied to other viruses—among them those of distemper and yellow fever—and prophylaxis against distemper along these lines has been practised in the field with success. Whether the formalised vaccine is dead or merely attenuated is still in dispute, but whichever view be correct, it must be admitted that the immunity evoked by these vaccines is never as solid or as durable as that called out by live virus. Obviously the use of live vaccines has its dangers and limitations. In vaccination against small-pox advantage is taken of the fact that the virus of small-pox, when adapted to the cow, is altered in such a way that when implanted in human skin it gives rise merely to a local lesion, the evolution of which nevertheless confers immunity to small-pox. That this method of vaccination does not represent the ideal is shown only too clearly by the puzzling sequels reported during the last few years. Perhaps a stricter attention to dosage might mitigate or remove this disadvantage, but, be this as it may, the underlying principle involved is an important one, which must be kept in mind. In this respect recent work on the prophylaxis of fowl-pox is of interest. The viruses of fowl-pox and pigeon-pox are immunologically identical, but have so great a species adaptation that the possibility of using live vaccines of the latter virus for immunising fowls against fowl-pox suggested itself. In 1928 Lahaye[4] and Zwick, Seifried, and Schaaf[5] attempted this with some success, and Doyle[6] has now studied the subject afresh. He finds that pigeon-pox virus produces minimal lesions in the hen with no tendency to generalisation and no interference with health; furthermore, the virus does not spread from inoculated to normal birds even under conditions most favourable to contagion. The living vaccine is applied to a small area of skin denuded of feathers, and as a result of the mild infection which ensues the bird becomes immune to fowl-pox. This immunity is fully developed by the end of the second week and, although it does not confer complete protection against artificial infection, the immunity to natural infection is a solid one. Whether this method will prove superior to the use of heat-killed vaccines, which have their advocates, only extensive trial in the field will show, but Doyle reports that during the last six months over 50,000 doses of live vaccine have been supplied for use in infected flocks, and that the results have been very satisfactory.

[3] Published under the direction of Dr. Camille Lian. Paris: René Lépine. 1930. Pp. 570.

[4] Lahaye, J.: Ann. Vét. Méd., 1928, lxxiii., 297.

[5] Zwick, W., Seifried, O., and Schaaf, J.: Zeit. f. Infektionskr., 1928, xxxiv., 300.

[6] Doyle, T. M.: Jour. Compar. Path. and Ther., March, 1930, p. 40.

NEONATAL DEATH.

Yandell Henderson has said that the first quarter of an hour after birth is the most dangerous period of life, and that nothing in medical practice so nearly resembles the methods of the dark ages as those employed in dealing with the new-born baby which does not breathe. Dr. J. N. Cruickshank's study of neonatal mortality (see p. 1032) goes far to confirm this dictum, and shows that the great majority of deaths during the first month actually take place during its first few days. Of 800 infants who failed to live a month he found that no less than 71 per cent. died within a week. The problem of infant mortality—meaning the death of infants who have really established independent existence—is no longer so serious as the problem of stillbirths, for the causes of stillbirth are the causes of very early death. The death-rate in the first week of life is given by the Registrar-General as 23·5 per thousand live births, and in the city of Glasgow the figure is about the same, while for the second week the Glasgow figure is only just over 5 per thousand.

By far the commonest cause of this wastage of infant life is asphyxia and atelectasis, which account for 546 of Dr. Cruickshank's 800 deaths. Theoretical considerations suggest that during its last few weeks in the uterus every fœtus undergoes gradually increasing asphyxia corresponding with the gradual narrowing of the ductus arteriosus. The venosity of the blood reaching the fœtal brain is further increased during labour, when the placental circulation is cut off, and finally the concentration of carbon dioxide becomes so great that the respiratory centre is stimulated to initiate lung breathing. Unfortunately, excess of carbon dioxide paralyses instead of stimulating the respiratory centre, and if the concentration becomes too high the child is born asphyxiated or else the centre fails to establish respiration fully and patches of lung remain unexpanded. At present we have no satisfactory methods of rescuing the respiratory centre from its embarrassment. If one of the contributory causes is hæmorrhage, either from gross injury or from asphyxial ecchymoses, violent attempts at resuscitation may well make matters worse. Dr. Cruickshank suggests the remedy, well known to anæsthetists, of supplying oxygen with 5 per cent. of carbon dioxide, besides ensuring absolute rest, warmth, and quiet, and cleansing the respiratory passages from the amniotic fluid and meconium so often found in them. On the preventive side, improved antenatal supervision is bound to reduce the incidence of asphyxia, prematurity, and birth injuries. Miss Joyce Partridge, as a result of investigations[1] made under her Riddell Research Fellowship at the Royal Free Hospital, concludes that nearly half the infants who are alive at the commencement of labour, and yet are born dead to healthy mothers, die solely because they have sustained intracranial injury at the time of birth. She regards relaxation of the pelvic

[1] Jour. of Obstet. and Gyn. of the Brit. Empire, 1930, xxxvii., 18.

ligaments as a real aid to parturition, which may make all the difference to the clearance between the fœtal skull and pelvic brim. In the pregnant woman an increase in the normal mobility of the joints can be recognised. In a series of 100 cases examined, there were four in whom joint movement was almost absent, and of these two had stillborn infants who suffered from intracranial injuries. In her view treatment based upon the presence or absence of antenatal mobility of the pelvic joints should reduce the numbers of stillbirths.

Another potent cause of early death is infection, either generalised or confined to the lung. It is difficult at present to say how this enters the body, but Dr. Cruickshank suspects the skin and respiratory tract, and finds no evidence for the widespread belief that the umbilicus and gastro-intestinal tract are common portals of entry. This group cannot be sharply distinguished from the first group, since prematurity is a common cause in both, and asphyxia and atelectasis predispose to the development of pneumonia. Dr. Cruickshank's investigations relegate both syphilis and congenital abnormality to a relatively unimportant place in the causation of neonatal death, except that the children of syphilitic mothers are often premature. Many so-called cases of congenital heart are really, he believes, cases of asphyxia livida.

The state of our knowledge hardly permits of very definite recommendations. Meanwhile all concerned with the improvement of maternity and infant life will agree with Dr. Cruickshank when he advocates better antenatal supervision, better education of doctors and midwives, more and better staffed hospital accommodation for lying-in women, and research into the problems of neonatal disease and prematurity. Ignorance of the actual cause of death has, he says, been one of the great obstacles to progress in the past. If a baby which is born blue and dies within a few days of birth is held to be suffering from some congenital cardiac abnormality, there is no stimulus to the obstetrician to worry about it. But neonatal deaths might be considerably reduced if every accoucheur came to feel that asphyxia after birth was as unnecessary and as curable as asphyxia under an anæsthetic.

A NEW CONCEPT OF TUBERCULOSIS.

AT the Royal Society of Medicine (Section of Epidemiology and State Medicine) on April 25th Prof. S. Lyle Cummins discussed some of the clinical and pathological factors underlying mortality-rates in tuberculosis. It must be conceded, he said, that tuberculosis, in spite of the fact that its causative germ is known, and that it has been the subject of endless investigations, is still imperfectly understood. Its manifestations at different age-periods, and under different cultural and social conditions, vary as greatly as if not one but several diseases were concerned. Brownlee's analysis of death-rates in tuberculosis had suggested that behind tuberculosis mortality lay a complex and imperfectly understood disease. The epidemiologist, said Prof. Cummins, should bear constantly in mind: (1) factors concerned with infection, (2) those favouring or retarding the development of infection into disease, and (3) those leading on to or postponing the fatal termination. Each of these three sets of circumstances was, in its turn, dual in nature, depending both upon the infecting germ and upon the infected organism. Epidemiologists, therefore, should not passively receive and analyse the findings and records of clinicians and pathologists, but should actively associate themselves in the attempt to find new methods of approach. A first necessity seemed to him the formulation of some concept which would cover not only the known facts of the disease, but also the equally well recognised facts of infection without perceptible disease. His own observations had led him to such a formula :—

"The first stage of tuberculous infection is one in which the lesions are in a larval state, localised as a rule at or near the portal of entry and in the nearest lymphatic glands, though as yet without any obviously harmful effect on the organism. This larval stage may lead on rapidly to the generalisation of the infection throughout the body, producing the natural tuberculosis characteristic of laboratory animals, infants and the adult members of hitherto uninfected communities after heavy infection; or it may remain latent in the form of larval lesions still capable, under disadvantageous conditions, of activation; or, if held in check, of creating the hypersensitive condition which leads to the inflammatory phenomena associated with reinfection and characteristic of the modified tuberculosis of later life in civilised communities. Alternatively, such larval lesions may serve only as a stimulus to the development of humoral and cellular resistance against the spread of tuberculosis, so that the infective process may end by becoming compensated and ceasing to be any further menace to health."

Such a concept, said Prof. Cummins, seemed to him to cover the known facts, and to afford a starting-point for further inquiries. The "larval" stage of tuberculosis could only be studied at autopsies, where death had occurred from other causes; and the contrast between "natural" and "modified" tuberculosis was also best appreciated in its pathological manifestations. "Modified" tuberculosis, of which the chronic phthisis of middle age was the most typical example, required study on clinical lines, and an examination of the survival periods of classified cases helped to throw light on this phase of the disease. The "compensated" tuberculosis of healthy adults represented a difficult problem which he had attempted to approach by means of tuberculin tests on quantitative lines.

RETIREMENT OF DR. A. B. RITCHIE.

ON April 23rd Dr. A. B. Ritchie retired after nearly twenty-seven years of service as medical officer to the Manchester Education Committee. The regular school medical service did not receive Parliamentary sanction until 1907, but Manchester was among the more progressive authorities which appointed its own officer before that time arrived. For six years Dr. Ritchie worked with one assistant, and in 1909 four medical officers and five nurses were appointed to assist him in carrying out the national scheme. His staff continually grew until at the present time it includes 19 full-time assistant medical officers, 4 specialists, 8 full-time dentists, 62 nurses, and 4 masseuses, while there are 9 school clinics covering the whole field of minor ailments and dealing with defective vision, the X ray treatment of ringworm and other skin affections, the ionisation of ears and the ultra-violet radiation of a variety of conditions. Dr. Ritchie also had medical charge of an epileptic school which accepts cases from all parts of the country and is the only one of its kind managed by an education authority. An orthopædic clinic is also now in operation, with two specialist surgeons; part of this scheme was the school for crippled children at Swinton, of which Dr. Ritchie had medical charge, and there is also a day cripple school, further developments being in contemplation. The ascertainment of mental deficiency has been under his control and the allocation of cases to the special schools. Of all this work Dr. Ritchie laid the foundations and built up a large part of the superstructure. On his retirement the medical and administrative officers both made him a presentation, and he received a token of appreciation from the teachers of the special schools for physically and mentally defective children. The gifts were tangible evidence of the real affection which Dr. Ritchie has inspired among his staff who although officially under his control were made to feel like professional colleagues; his reports always gave full credit for any special work done by his assistants. Dr. Ritchie's position of direct responsibility to the education committee is now unusual; the arrangement still exists at Birmingham, Leeds, Newcastle-on-Tyne, Stoke-on-Trent, and a few other places. The question of the relation of the public health department to the school medical

service will naturally arise on Dr. Ritchie's retirement, but it is evident that in an area of the size of Manchester the hands of the medical officer of health are already full with the work of the public health and poor-law services so that his control of school medical work can be little more than nominal.

ACADEMIC MEDICAL WORK.

THOUGH the origin of many of the British medical schools is independent of the universities, they have now all become attached to academic institutions while retaining a considerable measure of autonomy. They stand only on the fringe of academic life, however, for they are bound to regard with respect the prejudices of the voluntary hospitals which supply their clinical material, and to adjust the demands made by charitable institutions and by university conditions on the men who are chosen by a joint committee to serve both. The overwhelming amount of administrative work which falls to university professors, especially those attached also to hospitals, was the subject of comment in the last annual report of the Medical Research Council, and is emphasised by the report for the year 1928–29 of the University Grants Committee.[1] This committee notes that the embarrassment of excessive administrative work is not a new one; it was deplored over 40 years ago by the late Prof. Henry Sidgwick, of Cambridge, who made the following despairing entry in his journal: "Alas! with boards general and special, committees of boards, syndicates and sub-syndicates, there is a luxuriant fungoid growth of administrative work feeding on the best juices of academic life. One longs for a benevolent despot, 'one still strong man,' in a blatant University." The head of a big scientific department at a modern university, asked to estimate the proportion of his time spent on routine and administrative work, on teaching and on research, complains that research has usually to fight a losing battle against matters of urgency. He adds that men invited to join the department have given as a reason for their refusal the fear that administrative duties would prohibit their getting on with their own work, and that they are right.

The heads of departments, who are largely chosen in the first place for their original work, should assuredly be free to carry it out. The problem is partly, but not entirely, an economic one. The provision of secretarial assistance for heads of big departments would undoubtedly save a good deal of time, but even more, it seems, would be saved by such a simplification or rearrangement of a university's—and a hospital's—business as would lighten the labour of attendance at conferences and committees.

Other questions discussed in the University Grants Committee report deal with salaries, superannuation, tenure of office and status, the social life and employment of students, and the promotion of post-graduate scholarships. The report is partly statistical. It gives the detailed income and expenditure of some 50 universities or colleges subsidised by the Treasury through this committee, whose annual budget of £1,550,000 is to be raised next year to £1,800,000. Other tables show the number, age, and sex of the students, the faculties in which they are distributed, and whether the object of their study is to obtain a diploma, a degree, or a higher qualification. The overlapping of certain figures and the omission of all information about Guy's Hospital Medical School, which does not accept official help, necessitates scrupulous care before general conclusions are drawn from the tables lest inferences should not be justified. For example, in certain of the London medical schools the proportion of students who have acquired a diploma rather than a degree is apparently as high as 12 to 1, and in one of the schools 22 diplomas but no degrees were obtained in the year under review; but since the degrees in medicine and surgery granted by the universities of Oxford and Cambridge are included only in the figures of these universities, this proportion of students in each school reading for the diploma of the conjoint or any other board, and not for a university degree, cannot be ascertained. The omission of Guy's indeed diminishes the value of all the comparative information provided about the London schools, but a good deal may be inferred from the figures given. The examination of the tables included in succeeding annual reports of the University Grants Committee gives a fair moving picture of the waves of popularity of the institutions composing the universities of the United Kingdom.

[1] H.M. Stationery Office. 1930. 3*s*. 6*d*.

INJECTION TREATMENT OF PILES.

SLOUGHING occasionally occurs after injection of hæmorrhoids with 5 per cent. quinine-urea, and Dr. B. Saad, of Beirut, reports an incidence of ten such cases among 600 injections. The usual symptoms, he says, are immediate pain of variable extent, a feeling of weight in the rectum, dysuria, and a constant desire to defæcate. A swelling can be palpated with the finger, and proctoscopy shows a sloughing pile. The slough takes 10 to 15 days to separate, and always heals. There are several causes of this complication, the commonest being reinjection of a pile already sclerosed by a previous injection, or too superficial injection. Saad repeats Bensaude's advice—never to inject an external pile or a prolapsed internal pile without first reducing it, and never to inject a pile that is already sclerosed. Furthermore, the injection should always be made deep into the submucous layer. For treatment of a slough, hot baths and local application of Ziehl's solution are recommended.

ETHYLENE ANÆSTHESIA.

THE acceptance of ethylene as an anæsthetic has been far wider in the United States and in Canada than in Great Britain. A questionnaire recently circulated to hospitals in America elicited replies relating to 332,721 administrations of the gas. This popularity may perhaps follow naturally the fact that the modern use of ethylene was initiated in Chicago. The gas had been tried as long ago as the middle of last century by Dr. Thomas Nunnely, of Leeds, but it had never come into general use at all, partly, no doubt, through chemical difficulties in preparation. The reason why it is not very frequently used in England appears to be mainly that its advantages over nitrous oxide are so slight when the latter is given in the manner now made possible by the evolution of efficient and easily controlled machines. Ethylene is a little the more potent of the two gases, and has superior relaxing powers. This slight advantage, however, hardly seems to weigh against nitrous oxide used with judicious addition of small amounts of ether. That, at any rate, was the conclusion we arrived at after listening to the discussion which followed Mr. R. J. Clausen's paper at the Royal Society of Medicine and to that excellent paper itself. Mr. Clausen was an enthusiastic but judicious advocate of ethylene after the experience of 371 cases. He had administered the gas for as long as 2 hours and 25 minutes in one case. The main objection to ethylene in the minds of many is its highly offensive smell. Mr. Clausen meets this by conducting away the patients' expirations through a length of rubber tubing which terminates either at the edge of the theatre or actually outside it. Apparently about 50 gallons of the gas are needed per hour, and in abdominal cases it is almost always necessary to use some ether to obtain due relaxation. The risk of explosion does not appear to be so formidable a bogy here as in America. The questionnaire referred to above revealed ten instances of explosion, involving three minor injuries, four destructions of equipment, and one death.

CONTINUOUS BATH TREATMENT OF HEBRA.

TREATMENT by continuous immersion is associated with the name of Ferdinand Hebra, who employed it for various kinds of cutaneous diseases half a century ago at the Allgemeines Krankenhaus in Vienna. In the *Journal* of the American Medical Association for April 5th Dr. Gustav Riehl describes the present day applications of Hebra's method. The construction of the bath is designed to permit of the immersion of patients for periods of days, weeks, or even months continuously in plain water, medicated if necessary, at a temperature ranging from 85° F. upwards according to the requirements of the individual case. Mechanical arrangements ensure the easy transference of the patient into and out of the bath, the maintenance of a uniform temperature, and the rapid cleansing of the bath. At the hospital there are 22 of these baths in operation. Good results are claimed in the treatment of extensive burns, psoriasis, acute generalised dermatitis, weeping eczema, pemphigus, erysipelas, and other affections of the skin; of surgical cases, including septic wounds, discharging sinuses, fistulæ, bed-sores, and frostbite; of medical cases such as painful polyarthritis; and among neurological cases of myelitis, multiple sclerosis, tabes, tetanus, and certain psychical disorders accompanied by agitation or delirium. In this country such treatment has never been extensively employed. Years ago it was advocated by Sir James Barr in the treatment of typhoid fever, but the method never came into general use. Prolonged immersion, of some hours' duration, is employed on occasion in the treatment of skin affections and, for its sedative effect, in psychological disturbances; but there is no installation comparable to that described by Dr. Riehl, treatment when given being in some simple adaptation of the ordinary bath at home or in hospital. The continuous bath involves the use of expensive apparatus, special nursing and attendance, and is only practicable in an institution. In view of the wide range of cases for which benefit is claimed, such an installation should be attached to a general hospital, but the expense of installing, maintaining, and operating a suite of such baths would hardly be undertaken by the management of any hospital unless convincing evidence is brought forward that continuous immersion offers advantages in a wide range of maladies, unattainable by simpler methods. In the case of extensive bed-sores, burns, and septic wounds, the Viennese experience is certainly such as to render the method worthy of imitation in this country; a beginning might be made with a few experimental baths, to be extended if found to justify their existence. Possibly one or other of the new clinics for the treatment of rheumatic disorders might offer facilities for a trial.

VETERINARY RESEARCH IN SOUTH AFRICA.

THE first report[1] from the Onderstepoort Laboratories under the new director, Dr. P. J. du Toit, successor to Sir Arnold Theiler, lacks none of the excellence of previous reports, and there is substantial gain from the grouping of the articles into nine sections: protozoal diseases, virus diseases, bacterial diseases, parasitology, pathology, diseases due to poisonous plants, sterility, mineral deficiency, and miscellaneous. No one can study it without being impressed with the value, not only to the agricultural community but to the country generally, of State-aided research in veterinary science. The money expended by the Union of South Africa upon the development of the splendid organisation at Pretoria and upon its maintenance must have been repaid many times over by the results achieved in the prevention of animal diseases. Practical recognition of the value of the work to the Empire has now been given by the award of a capital grant of £10,000 and an annual grant of £11,000 for five years from Empire Marketing Board funds. A series of excellent photographs in the report shows the laboratory buildings and the animal accommodation. The laboratories have an extensive staff, the professional members of which alone number nearly 30.

One or two points of special interest may be selected for mention. The South African workers had until recently held the view that east-coast fever (*Theileria parva*) could not be transmitted with the blood of infected cattle, but the work of Sergent and others in North Africa in 1927 led them to carry out further observations upon this point, with the result that in 24 per cent. of cases it was found that infection resulted from blood inoculation by the subcutaneous and other routes, and that nearly 50 per cent. of these infections ended fatally. Quantities of blood such as 5 c.cm. intradermally, 100 c.cm. intraperitoneally, and 250 c.cm. subcutaneously resulted in infection. From this it would appear that Koch's bodies are by no means rarely present in the general circulation. Further studies have been carried out on the virus of bluetongue, a disease of sheep in certain parts of South Africa. Theiler, in 1905, showed this condition to be due to a filtrable virus in the blood, and found that by passage of the virus artificially through sheep it became so attenuated after the eleventh generation that it could be used with safety as a vaccine. Deaths were reduced from 11 per cent. to less than 1 per cent. For over 20 years Theiler's originally attenuated strain of virus has been used and has reached the fifty-fourth generation. No less than 25,000,000 doses of vaccine (blood) have been issued with eminently satisfactory results. The attenuated vaccine is preserved in a mixture of glycerin, potassium oxalate, and carbolic acid, in which it has shown remarkable longevity. In the present report it is pointed out that Theiler's work has been fully confirmed and a new strain of the virus has been attenuated for field use. Vaccine preserved as described has been found alive after 18½ years at room temperature, though its antigenic properties were somewhat weakened. This illustrates the remarkable resistance of this virus, a feature also of the virus of South African horse sickness.

The articles upon botulism in animals and birds in South Africa are of interest alike to the medical and veterinary research worker. Botulinus type organisms have been shown to be widely distributed in the soil in South Africa, and the types found by Robinson are considered by him to be the types D and E (Weinberg), though, as he remarks, it seems inconceivable that types A and B can be absent from South Africa when they are known to have such a ubiquitous distribution in other countries. Cases of human botulism have not so far been recorded in the country; botulism has, however, been found in cattle, horses, and birds in South Africa. In cattle the source of the toxin is the bones of carcasses which cattle are induced to eat on account of a phosphorus deficiency in the soil, in horses the source is the carcasses of rats in the fodder, and in ducks the source was not determined. The South African workers have been unable to show that toxin-free bacteria of botulinus type can produce toxin in the alimentary canal of the living animal. Investigations into the life-history of the tapeworm (*Moniezia expansa*) leave the problem still unsolved. There is an interesting account of the pathological lesions attributed to schistosomes in sheep. The article on skin cancer of the Angora goat is a useful addition to the growing literature upon cancer in the domesticated animals. The section of the report devoted to sterility in cows by Prof. Quinlan occupies no less than 222 pages containing 88 illustrations, and that dealing with the breeding of cattle upon phosphorus-deficient veld occupies 107 pages, including 71 illustrations. Three of the longest articles are theses which have been accepted for the degree of D.V.Sc., one of Toronto and two of the South African University.

[1] Fifteenth Annual Report of the Director of Veterinary Services, Department of Agriculture, Union of South Africa, 1929. Two vols. Pretoria: Government Printer. Pp. 1209. 10s. per vol.

CONGRESS FOR SEX RESEARCH.

THE second International Congress for Sex Research will be held in London in the House of the British Medical Association, Tavistock-square, W.C., from August 3rd–9th. The preliminary programme provides for general meetings, to be held in the morning, at which problems of present interest will be reviewed by prominent workers. The afternoons will be devoted to discussions on the general papers and sectional meetings. Among the subjects to be discussed at the general meetings are puberty and maturity, problems of the physiology of the sexual glands, and hormone therapy. Membership of the congress is restricted to persons engaged in teaching or research in biology, psychology, and allied sciences and to members of the medical profession. Those who wish to take part are invited to apply to the Congress Secretary, Department of Animal Genetics, King's-buildings, The University, Edinburgh.

THE next session of the General Medical Council will commence at 2 P.M. on Tuesday, May 27th, when the President, Sir Donald MacAlister, will take the chair and give an address.

Dr. Julia Marcella Browne has been appointed medical officer of health for the Metropolitan Borough of Stepney in succession to Dr. Daniel Thomas who died in December last. This is the first time a woman has secured a whole-time post as chief M.O.H., although others have held acting rank in St. Pancras for considerable periods. Dr. Browne graduated in medicine from University College, Cork, in 1917, taking the diploma in public health of the R.C.S.I. in 1920.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

LXXI.

THE SIGNIFICANCE OF BLOOD GROUPS.

PART II.*

Testing for Compatibility.

PRACTITIONERS faced with the possibility of being called upon to perform an emergency transfusion are prone to seek some sign of compatibility, but none can be given them. The mixture of drops of the blood of proposed donor and recipient on a slide may produce some doubtful agglutination, more frequently it will merely produce a mess. There is no short cut to the certain determination of compatibility. For a grouping test known sera of Groups A and B and an emulsion in normal saline of the red cells of the proposed donors are required. Whole blood will give rise to trouble from various causes, the principal of which is rouleau formation. The sera may be bought from various commercial houses but as noted last week its titre is always rather uncertain. Sufficient blood for the testing of the donor can be obtained by simple finger prick. The strength of the emulsion does not matter within wide limits; it is my custom to use the red cell pipette of the Thoma-Zeiss hæmacytometer and to make approximately a 1 in 100 dilution of the blood in normal saline. In the absence of a pipette a couple of drops in two or three c.cm. of normal saline in a test-tube will serve.

For the actual grouping two plane slides are required; these are marked A and B respectively; one drop of the red cell emulsion is placed on the centre of each of these slides; to the drop on the slide marked A a drop of the A serum is added and to that on the B slide a drop of the B serum; red cells and serum are then thoroughly mixed. In some case agglutination will appear at once with the appropriate serum; the rapidity of its appearance depends upon the titre of the agglutinins in the serum and of the agglutinogens in the red cells. In no case is it safe to make a final determination until the preparations have stood for at least ten minutes and it is my custom to allow half an hour. The drops of mixed red cells and serum should be gently agitated before they are examined. It is preferable to examine them with the low power of the microscope but failing this a hand lens will serve; naked eye observation may fail to identify lesser degrees of agglutination.

In matching two bloods the procedure is exactly the same as for grouping, the only difference being that in matching the red cells of the proposed donor are mixed only with the serum of the proposed recipient. Since matching does not demand the use of sera of known groups, it is in some ways simpler than grouping, and as pointed out above is infinitely preferable on considerations of safety. The difficulty in matching is that it demands the serum of the proposed recipient. For this purpose two or three c.cm. of blood are required; this quantity can be obtained readily enough, but the difficulty arises in the speedy separation of the serum. With a centrifuge the serum can be separated out in a few minutes and where this apparatus is available the whole procedure of matching can be carried out in half an hour. Where no centrifuge is available, there is nothing for it but to withdraw the blood of the proposed recipient as soon as it becomes evident that a transfusion may be necessary, and to allow the serum to separate out while the donors are being collected. This usually takes an hour or so and by the time that the donors are ready enough serum may be available for the test. Whenever possible, however, the proposed donors should be sent, with a specimen of the serum of the patient, to a properly equipped laboratory and the test should be performed by a person with ample experience of the technique.

Matching is only necessary when the blood is to be introduced actually into the circulation of the recipient. Where blood is to be introduced hypodermically or intramuscularly, as is often necessary in hæmophilia, purpura, melæna neonatorum or other hæmorrhagic conditions, the group of the blood introduced is of no importance. Since it is known that the agglutinins do not develop until some months after birth it is also probable that no harm would be done by the introduction of blood without grouping or matching into the circulation of a new-born child, but if possible it is the best plan in all cases where blood is introduced into the circulation to make sure of compatibility.

Medico-legal Applications.

The blood groups have certain important medico-legal bearings. Since the agglutinogens A and B behave as Mendelian dominants, they cannot appear in the blood of the offspring without having been present in the parental blood. From this it follows that their appearance in the blood of a child when they are absent from that of the putative parents, is in itself proof that the relation is not that supposed. This fact has obvious importance in cases of disputed paternity. The field of possibilities under this head has within the last few years been considerably narrowed as a result of the work of F. Bernstein who from mathematical considerations has provided strong evidence for the belief that the whole inheritance of the groups is governed by the existence of the dominant factors A and B, represented by the agglutinogens, and of a recessive represented by the absence of both of them; this rece sive, in conformity with the nomenclature used above, may be described as O; according to Bernstein's hypothesis it is allelomorphic to A and B.[1] For practical purposes the position under Bernstein's hypothesis may be summarised as shown in Tables II. to IV.

All the available evidence goes to bear out the correctness of Bernstein's hypothesis, and there can be little doubt that apparent exceptions are due to errors of observation. No case of disputed paternity has yet been decided in the British courts upon the evidence afforded by the blood groups, but such

* Part I. appeared last week.

[1] See THE LANCET, 1928, i., 1182.

evidence has been freely admitted before the German courts and in a number of cases has been decisive. The writer has twice been asked for opinion in cases of disputed paternity; in both cases the evidence afforded by the blood groups was equivocal and was not placed before the court. In placing evidence as to blood group before a court in a case of disputed paternity it is not sufficient to rely only upon tests of the red cells; the serum also must be tested with red cells of known agglutinogen content, and in view of the differences of titre

TABLE II.

Parents.	Offspring.	
	May be.	Cannot be.
AB + AB.	AB, A or B.	O.
AB + A.	,,	,,
AB + B.	,,	,,
AB + O.	A or B.	AB or O.
A + A.	A or O.	AB or B.
A + B.	AB, A, B or O.	No group impossible.
A + O.	A or O.	AB or B.
B + B.	B or O.	A or AB.
B + O.	,,	,,
O + O.	Must be O.	AB, A or B.

TABLE III.

Group of child.	Group of mother.			
	AB.	A.	B.	O.
	Paternal group must be—			
AB.	A, B, or AB.	B or AB.	A or AB.	Impossible.
A.	Any group.	Any group.	,,	A or AB.
B.	,,	B or AB.	Any group.	B or AB.
O.	Impossible.	O, A or B.	O, A or B.	O, A or B.

TABLE IV.

Group of child.	Group of mother.			
	AB.	A.	B.	O.
	Paternal group cannot be—			
AB.	O.	O or A.	O or B.	Impossible.
A.	All possible.	All possible.	,,	O or B.
B.	,,	O or A.	(All possible.)	O or A.
O.	Impossible.	AB.	AB.	AB.

in both agglutinogen and agglutinin it is desirable to confirm all results by absorption of a known potent serum of Group IV. with the red cells of the subject. Mere testing of the red cells against known sera of Groups A and B is by no means a satisfactory way of establishing the blood group for medico-legal purposes.

Blood Groups in Criminal Cases.

The determination of the blood groups has certain other medico-legal applications mainly in connexion with criminal practice; thus it may be of importance to determine the group of the blood staining clothing or weapons in cases of murder and wounding. The establishment of the fact that blood stains on the clothing of the accused are of the same group as that of the victim, and different from his own, would be a very strong point for the prosecution; so thoroughly has this been realised on the continent that in certain European countries, of which Russia is one, it is customary to determine the blood groups of all persons concerned with crimes involving wounding. When it is desired to ascertain the group of blood staining clothing or instruments no attempt should be made to remove the blood, but the stained articles should be despatched with speed and with as little disturbance as possible to the laboratory at which they are to be examined.

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Special Articles.

THE TOXÆMIAS OF PREGNANCY.

EXPERIENCE IN SIAM AND IMPRESSIONS WHILE TRAVELLING.

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I THINK it is impossible to exaggerate the importance of the contention that any explanation offered for a disease should have a universal application. It has been my privilege this year to travel from Japan through French Indo-China, Malaya, India, Iraq, Syria, and Palestine to Cairo. I visited hospitals in all these countries and in the ports of China, and met and conversed with a considerable number of doctors. There is not the slightest shadow of doubt that the toxæmias of pregnancy are very much less common throughout the East, if Japan be excepted, than they are in the West. Hyperemesis gravidarum is practically unknown in these countries. Accidental hæmorrhage of the toxæmic variety is an exceedingly rare obstetric complication, while eclampsia is much less common than in the West, and usually of a milder type. It is obvious that in such countries accurate statistics are not available, and opinions must be formed from the figures of isolated hospitals and from the experience of practitioners with whom one comes into contact. A letter received from Colonel Graham, I.M.S., Public Health Commissioner with the Government of India, states that the statistics I requested, showing the incidence and distribution of the toxæmias of pregnancy in India, are not available. It would be of great value if some responsible person could spend the time travelling and collecting such statistics as are obtainable in these countries.

Three Years in Bangkok.

I can speak with more authority on the incidence of these diseases in Siam. I have met nearly all the missionary doctors in the country, and they are emphatic that all the toxæmias of pregnancy are very rare. Not one doctor had ever seen a case of toxæmic accidental hæmorrhage, and I could only hear of six cases of eclampsia in their united experience, most of the doctors never having seen even one case. No system of purdah obtains, and if these diseases existed the doctors would most assuredly be cognisant of them. Bangkok is a city of some 700,000 inhabitants. I was for nearly three years in charge of the largest obstetric service in the city, larger than all the other obstetric services in the country put together. I did not see a single case of toxæmic accidental hæmorrhage.

The following list comprises all the toxæmic cases that I saw.

1. There were seven, possibly eight, cases of eclampsia, but only four had fits in the hospital.

2. Seven patients suffered from a severe grade of anæmia, presumably aggravated by the pregnancy, but only one from the pernicious type.

3. Two fatal cases of toxæmia were associated with hydatidiform moles. One of these patients suffered from hyperemesis gravidarum, and the other had anuria.

4. Two fatal cases of toxæmia were associated with mania early in the pregnancy; neither of them came to autopsy. It is just possible that these patients suffered from malignant malaria.

5. I saw, in consultation, one case of hyperemesis gravidarum in a wealthy neurotic Siamese woman. The vomiting was completely checked, but the patient nevertheless died a day or two later. No post-mortem examination was permitted. This was the only case of hyperemesis gravidarum associated with a normal pregnancy that I saw in a Siamese woman, although in the same period I was called to see three European women who suffered from

this complaint, although the European population of Siam is so small. No Chinese woman suffering from this complication was admitted to the hospital.

Bathing in Public.

This almost complete absence of the toxæmias of pregnancy was very surprising and extremely suggestive. Pyorrhœa alveolaris is the rule rather than the exception in Siam. Practically every patient is infected with one or more varieties of intestinal parasites. Cystitis and nephritis are common. So common is a mild chronic nephritis among the women that I believe it to be an ascending infection from the bladder. They all bathe twice or more often in the day in the klongs or canals into which they urinate and defæcate; the water must be a fine emulsion of bacteria. They bathe in a sarong or panung, which is similar to a wide skirt, which reaches from their axillæ to well below their knees. When a woman wearing such a garment sits down rapidly in the canal there is a very definite pressure of water forced between her legs, and I believe well into her vagina and urethra. I caused a woman, an hour after she had drunk plenty of water, to bathe in a bath in which was a strong solution of methylene-blue. The dye did not stain the thighs or the mucous membrane of the vulva. On urethroscopic examination, however, a distinct jet of methylene-blue was seen to escape from a crypt on the left side of the urethra about ¾ inch from the external meatus. It is interesting to notice that Mohammedan women are not allowed to bathe between the hours of sunrise and sunset during the fast of Ramadan, although no such restrictions are placed on men.

Although chronic nephritis is exceedingly common, marked albuminuria during pregnancy is rare. Lactosuria is excessively rare, and was only noted in one out of about a thousand patients whose urine was examined for sugar. In this case the urine only reduced Fehling's solution for two days. Appendicitis is certainly relatively very uncommon, while disease of the gall-bladder of any kind whatsoever apparently does not exist among the Siamese. The Siamese eat three meals in the day. Their diet consists of rice, cooked vegetables, a little fish, usually salted, and a little pork perhaps once a week. The wealthier classes in the cities are tending to eat more meat. As a race they do not suffer from constipation but rather from diarrhœa caused by the intestinal parasites. Contrary to the statements made by theoretical enthusiasts, the people living in the most primitive parts of Siam have their bowels opened only once in the day, and usually in the morning. The climate is always fairly warm and the clothes are so convenient that a woman can defæcate at any place at any time of the day. The world is her privy and her panung is her closet.

Simple Life.

Their clothes are light, frequently changed and washed, and allow a generous portion of the body to be exposed to the beneficent rays of the sun. They almost live in the open air. The children run about naked until they are 4 or 5 years of age, the little girls merely wearing a silver or gold sporran. There is a complete absence of worry and haste, partly accounted for by the Buddhist doctrine and partly by the ease of living in a generous country in the tropics. A little rice, a few vegetables, a little tobacco, a home-spun cloth, a house that can be built in a few days—these are all the wants of the peasants who live to-day in the same way as their forefathers did a hundred years ago. Their diet is obviously deficient in vitamins A and B, as vesical calculi and beri-beri are very frequently encountered. The good effect of sunlight can be gauged by the fact that rickets is practically unknown, and I have not seen one flat pelvis in a Siamese woman. There is one other article of diet that must be mentioned. The Siamese constantly eat lime with their betel- or areca-nut. This may provide the women with the necessary calcium, for they never drink milk and there is certainly not much calcium in their food.

The Ports of China.

In China I visited Shanghai, Hong-Kong, and Swatow. Gall-bladder disease, appendicitis, cancer of the intestines, and the toxæmias of pregnancy appear to be very uncommon in Southern China. A doctor who had been for 20 years in charge of a hospital near Amoy, in which 20,000 patients were treated annually, told me that during the whole of that time there had only been one case of appendicitis in a Chinese patient living on a Chinese diet. The figures of the Margaret Williamson Hospital, Shanghai, the largest hospital for women in China, suggest a higher incidence of these conditions in Shanghai than in Siam or Southern China. The women there, however, do not live in the same simple manner as in the country. They buy sweetstuffs and cooked foods from the itinerant hawkers who parade the streets all day and well into the night, and are very constipated. The climate is very cold during the winter months and the women wear thick clothes, which are not frequently washed or changed. Moreover, it must be remembered that human urine and fæces have a distinct commercial value in China, and a Chinese woman will resist the temptation to pass fæces until she can deposit it in her family store, when her nitrogen can either be sold or used for the household gardens. This reticence in a large city tends to favour constipation. Then, too, the Chinese trousers are not so convenient as the Siamese panung.

India and the Nearer East.

In India the toxæmias of pregnancy are not common, but their distribution is interesting. The large cities appear to provide a higher percentage of cases than the country areas in which the vast majority of Indians live. This increased incidence in the cities is probably universally true. Eclampsia is fairly common in Southern India—i.e., Madras and Bangalore. There were only ten cases of accidental hæmorrhage recorded in the three annual reports that I have of the Madras Government Maternity Hospital, although there were in that time over 8000 deliveries. Moreover, 10 per cent. of the patients treated were Europeans and Anglo-Indians. I visited the large Lady Hardinge Hospital for Women in Delhi, and they had not had a case of eclampsia or accidental hæmorrhage for over 12 months. Osteomalacia, however, is very common there and in the north-west of India; it only affects those women who live a very secluded purdah life. Anæmia is very common throughout the East and is largely due to intestinal parasites, especially the hookworm, which infest so large a proportion of the people. The anæmia is aggravated by pregnancy and is usually of the secondary type. In Bombay, however, anæmia of the pernicious type is frequently associated with pregnancy. This anæmia only occurs during the hot season and is remarkably amenable to treatment by liver extract, whereas the ordinary secondary anæmia is not influenced by this preparation. The diet, climate, habits, clothes, and customs vary enormously in that vast continent. For instance, rice is the staple diet in Southern India, whereas wheat is eaten in the North. No Indian, however, eats much meat. Life there, outside of the cities, is tranquil and the sun shines every day, except in the houses of those unfortunate women doomed to a strict purdah existence.

I visited practically every mission hospital in the Persian Gulf. Not one of the doctors had seen a case of accidental hæmorrhage or hyperemesis gravidarum. Their impression was that eclampsia was distinctly less common there than in America. I visited the excellent new hospital and medical school at Bagdad. They had not had a case of hyperemesis gravidarum or accidental hæmorrhage, and had not lost a case of eclampsia. Dr. Dorman, for many years professor of obstetrics and gynæcology in the American University at Beirut, had never seen a case of accidental hæmorrhage, and was of the opinion that it was a text-book disease to be put in the same

category as locked twins. Eclampsia, in his experience, was uncommon and was certainly less frequent during the war when meat was scarce and the diet restricted.

In Jerusalem and Cairo the same emphatic assertions were made about the relative rarity of the pregnancy toxæmias. On the other hand, the surgeons in Jerusalem and Cairo were convinced that appendicitis was on the increase in those cities, and that the increase of cases synchronised with a greater consumption of meat, both fresh and tinned.

Appendicitis in Japan.

In concluding this rapid survey I must refer to the astounding difference in the incidence of diseases between Japan and the rest of the Orient. At one surgical clinic in the Imperial University of Tokyo there were between 80 and 100 operations for carcinoma of the stomach, and between 200 and 300 appendicectomies in the year, out of a total operating list of about a thousand cases. I gathered, from what was told me in Tokyo and Kyoto, that diseases of the gall-bladder, cancer of the intestines, appendicitis, and the toxæmias of pregnancy were as common in Japan as they are in Europe. The large cities of Japan are very similar to those of Europe, although the sanitary arrangements are bad, while the climate is very little better than that of England. The houses are small, badly ventilated, and badly warmed, usually by charcoal stoves. The Japanese lavatories are certainly anything but attractive, and the women are said to be very constipated. The exquisite kimono, while being a thing of entrancing beauty, is certainly not hygienic and denies access to the body to even the most inquisitive rays of the sun. The diet would appear not to be very dissimilar from that of the Chinese and Siamese. It seems to be deficient in calcium, for the Japanese do not drink milk, neither do they chew the betel-nut with lime. They also probably eat more than do the Chinese and Siamese, while the more educated Japanese are tending more and more towards European habits, customs, and diet. Moreover, the Japanese, from whatever angle they are judged, can hardly be said to be oriental in the same sense as the Southern Chinese and Indians.

THE CAUSES OF NEONATAL DEATH.

A STUDY of 800 cases of death within the first 28 days after birth has been made in Glasgow by Dr. J. N. Cruickshank, and his results are published by the Medical Research Council.[1] It has previously been shown that the first week of life is the most dangerous, and in this series 71 per cent. of the infants died within seven days. Of the remainder, 18 per cent. died during the second week, 8 per cent. during the third week, and 3 per cent. during the fourth week. The fact that the maternal death-rate and the first-week infantile death-rate have remained stationary, despite the striking reduction in the later infantile death-rate, suggests the possibility of some connexion between the two. The two main groups of causes of death among new-born infants are injuries or disturbances due to delivery, and illness or infection. A third small group is represented by developmental abnormalities, and a fourth by thrombosis or hæmorrhage associated with maternal toxæmia. Recent work, it is stated, has tended to minimise the significance of environmental influences and malnutrition before birth.

Asphyxia Neonatorum, Birth Injuries, and Allied Conditions.

Group 1.—There were 540 cases in this group, 140 mature and 400 premature. In 51 of them some pneumonic consolidation was found, either by the naked eye or microscopically; only three of these were mature infants. Many of the children showed birth injuries; 146 had gross intracranial hæmorrhage, and 121 had tears in the dura. The effects of the injury and, to a certain extent, the liability to the injury are increased by the asphyxial congestion present in the new born child. Sixteen in this group showed developmental anomalies and 15 of them had syphilitic mothers.

Dr. Cruickshank describes these cases as "delayed stillbirths." For some reason or other these children had not succumbed during birth, but had survived in a more or less precarious state for periods varying from a few hours up to three weeks. Fifty-one of them lived on into the second week, but the two which survived this period were exceptional. A certain degree of asphyxia is a physiological accompaniment of the transition from intra-uterine to extra-uterine life and the consequent readjustment of the circulation. Failure to establish full respiration causes atelectasis, a very common accompaniment of asphyxia in neonatal deaths. This is associated with engorgement of the viscera and hæmorrhages. An unexpanded lung with widespread hæmorrhagic œdema is common in premature infants who live for a few days, and affords ideal conditions for the growth of organisms; hence broncho-pneumonia is often superadded. The two main factors which seem to be important in the production of asphyxia are the fact that an excess of carbon dioxide will paralyse the respiratory centre and that the centre may have its vitality diminished by interference with its blood-supply. The theoretical explanation for the establishment of respiration during parturition is that the carbon dioxide tension in the fœtal blood is steadily increased during the later weeks of pregnancy, owing to the narrowing of the ductus arteriosus, and finally to the interruption of the placental circulation. The child is thus in a state of partial asphyxia until the respiratory centre is sufficiently stimulated by the carbon dioxide to establish respiration. If, however, the concentration of carbon dioxide is too great, the centre will fail in this task. In other cases the centre may fail as a result of pressure on the cerebral circulation during birth.

Asphyxia produces engorgement of the veins throughout the body, embarrasses the heart, and ruptures small capillaries, causing hæmorrhages of greater or lesser extent. Dr. Cruickshank believes that the underlying asphyxial element is important—even where there are gross injuries—in determining the extent of bleeding. That heart failure plays a significant part in some of these deaths is shown by the fact that withdrawal of blood from the umbilical stump will sometimes revive a moribund infant. Œdema of the brain and meninges is practically always found in asphyxial cases and may be the cause of death.

Neonatal Infections.

Group 2.—Generalised septicæmia—i.e., multiple foci indicating a spread of infection by the blood stream—was found in 120 infants, often in association with pneumonia. Infection before labour must be very rare, but intra-partum infection is probably more important than was once realised. Even in cases of septicæmia it is rare to find inflammatory changes in the stump of the cord, and the portal of entry of the infection is still a matter of conjecture. The infant's skin is very vulnerable, and many cases of sepsis are started by surface lesions, such as pemphigus, eczema, furunculosis, intertrigo, and napkin rashes. Owing to the difficulty of deciding whether a pneumonia is primary or secondary, it is hard to estimate the relative importance of the respiratory tract. Inhaled infection undoubtedly causes many cases of pneumonia in babies, and many of these children die with generalised septicæmia. Infection by swallowing is probably much less common.

[1] Special Report Series, No. 145. London: H.M. Stationery Office. 1930. Pp. 87. 1s. 6d.

The Lesions found Post Mortem.

In asphyxia livida the most striking feature is the venous engorgement with petechiæ and extravasations. In asphyxia pallida there may be no congestion, but the distribution of blood does not follow the same laws as in adult shock. Developmental abnormalities were rare and most of the cases of supposed congenital heart disease are probably cases of asphyxia livida. There was never any myocarditis or endocarditis, even in septicæmic cases; small hæmatomata may simulate vegetations if the valves are not examined histologically. Pericarditis was found in six mature and seven immature infants. Pneumonia was the commonest lesion appearing in 197 cases, and in practically two-thirds of all non-asphyxial or atelectatic cases. The distribution and spread of the lesions is bronchial but the patches often resemble those of adult lobar pneumonia; the infection more often occurs in incompletely expanded lung, especially in weakly premature children. The respiratory tract often contains liquor amnii and meconium, and this factor undoubtedly predisposes to pneumonia. Two groups of pneumonia are to be distinguished. The histological features of the atelectatic type are: (1) great congestion; (2) irregular expansion; (3) patchy distribution of consolidation and catarrh; (4) associated bronchitis; (5) constant inflammation of the smaller bronchi and bronchioles; and (6) peribronchitis and peribronchiolitis. Plugs of mucus, cell debris, and meconium are often found in the bronchioles, but pleurisy and abscess are rare. Far more numerous were cases of the septic type, where the lung tissue is for the most part fully expanded and only moderately, if at all, congested. Often this pneumonia is associated with general septicæmia. The affected lung tissue is dark red and peculiarly firm; it exudes blood-stained froth, and the bronchi contain mucopurulent exudate. Pleurisy and abscesses are often present.

Alimentary Disturbances.

Infections of the gastro-intestinal tract were rare in this series, even after a history of diarrhœa and vomiting. These symptoms are probably associated rather with a general disturbance of nutrition or a toxæmia. There were no cases of gastric ulcer and only one of duodenal ulcer, but the large intestine was ulcerated in five cases and congenitally enlarged in four. One small premature infant, the child of an eclamptic primigravida, had appendicitis, associated with generalised septicæmia. Peritonitis was present in 21 mature and 23 immature babies. One child had jaundice due to obstruction by a congenital band, and two had splenomegaly.

Central Nervous System.

There was gross intracranial hæmorrhage in 161 cases, 86 per cent. of whom died within the first week, 36 per cent. during the first day. Twenty cases showed some form of infection, while the remainder died from asphyxia and atelectasis. Five were occipito-posterior presentations, two face and brow, eight transverse, and 38 breech. In 31 the delivery was by forceps, and in 32 more there was some manipulative interference. Capillary oozing was almost universal in asphyxiated infants, and gross bleeding due to birth injury was found in 16·2 per cent. Bleeding above the tentorium may cause no symptoms, but below the tentorium it soon causes pressure on vital parts. In very premature infants the choroid plexus may bleed, and choroid thrombosis is closely related to that type of intracranial hæmorrhage which is associated with disease of the mother or sepsis in the infant. Sixty-seven of the infants with tentorial tears were mature and 64 were premature. These cases included four occipito-posterior presentations, three face and brow, six transverse, and 32 breech. Death took place during the first week in 91 per cent. and during the first day in 43 per cent., the cause of death usually being asphyxia and atelectasis. Intradural bleeding over the spinal cord is rare compared with intracranial meningeal bleeding, partly because the cerebellum, pons, and medulla act as a sort of valve to block the foramen magnum. The lumbar puncture fluid may therefore be practically free from blood, even if there is much meningeal bleeding within the skull. There is, however, usually xanthochromia. Blood may be found in the cerebro-spinal fluid, on the other hand, as a result of extradural bleeding in the spinal canal.

Meningitis occurred in 33 cases, most of the infants dying between the fifth and the thirteenth day. It was associated with septicæmia in 29 cases and with pneumonia in 12 cases. There were 17 examples of abnormality of the central nervous system.

Renal Conditions, Sepsis, Hæmorrhage, Syphilis.

Abnormalities of the kidney included: (1) congestion due to asphyxia; (2) gross hæmorrhage due to injury; (3) thrombosis and infarction associated with toxæmia of pregnancy and sepsis neonatorum; (4) degenerations of the tubular epithelium associated with infections and cachexia; (5) developmental abnormalities, such as hydronephrosis, polycystic kidney, ectopia, and calculus (one case). In no case was there any lesion that could be called nephritis, though in some feeble cachectic infants the degenerative changes justified the term nephrosis.

Cellulitis was found in 19 mature and 10 premature infants, and swabs revealed streptococci in ten cases, staphylococci in seven, and coliform bacilli in three cases. Five of the babies were delivered with forceps, three by Cæsarean section, and nine others suffered interference during labour. Abscesses were found in ten mature and ten premature infants, including six cases of pemphigus neonatorum, but umbilical sepsis was only found seven times in the whole series. The six cases of pemphigus included in the series were part of an epidemic of 15 cases, of whom seven died from general sepsis.

There were 30 cases of thrombosis; in 11 of these the mother had some form of toxæmia, and in most of the others the infant had septicæmia. Lesions were usually found in the kidney or brain. Ten infants died after severe bleeding, apparently due to a hæmorrhagic diathesis; only one of these was premature.

The Wassermann reaction was positive in 26 cases, but spirochætes were only found in six. Thus congenital syphilis is not a common cause of neonatal death. Children of syphilitic mothers, however, are often born prematurely, and seem to be particularly likely to develop sepsis neonatorum. Death was due to developmental defects and abnormalities incompatible with survival in 22 cases.

Conclusions.

Dr. Cruickshank concludes that a very large proportion of "neonatal" deaths occur during the first few days of life. Their cause is to be sought among the causes of stillbirth and the complications of labour, which cause asphyxia livida—an exaggeration of the normal congestion present at birth—and asphyxia pallida, a state of shock often associated with injury and hæmorrhage. Prematurity is a potent factor in accentuating the effects of asphyxia and atelectasis. It is often due to ascertainable causes, such as maternal disease or toxæmia, accidental or essential ante-partum hæmorrhage, ecbolic drugs, violence, or over-exertion. Infantile infection is usually acquired in the postnatal period; important predisposing factors are prematurity, asphyxia, and atelectasis, and the commonest portals of entry are the skin and respiratory tract. There is a tendency to generalised septicæmia.

Preventive measures, therefore, should include an attempt to reduce asphyxia and birth injuries by improved antenatal supervision and greater facilities for antenatal examination and the indoor treatment of obstetrical cases. Other factors are better education of medical students, graduates, and midwives; the reduction of prematurity by more stringent control of ecbolic drugs, and the reduction of neonatal

infection by improved hygienic and housing conditions, and the provision of more hospital accommodation with adequate nursing staff.

Recent Advances in the Treatment of Asphyxia Neonatorum.

In an appendix Dr. Cruickshank sums up as follows the main points in the treatment of asphyxiated new-born infants: (1) the avoidance of all violent attempts at resuscitation; (2) the provision of absolute rest, warmth, and quiet; (3) the immediate toilet of the air passages so as to remove mucus, meconium, and liquor amnii; (4) the supply of oxygen together with 5 per cent. carbon dioxide in regulated doses; (5) the withdrawal of cerebrospinal fluid in cases of high intrathecal pressure and intracranial bleeding; (6) the maintenance of an adequate fluid intake by gavage until the infant is able to take the bottle; (7) care of the skin and accessible mucous membranes, but the avoidance of bathing until normal breathing and sucking power are established.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

Registration of Dentists in Bombay.

A BILL for the registration of dental practitioners in the Bombay Presidency has been drafted by the Government, and is now under consideration. The Bill provides for the establishment of a dental board, composed partly of members of the medical council, partly of dentists, the board to be associated with the medical council, which would exercise disciplinary powers over dentists as well as medical practitioners. Following the British precedent, provision is made for the registration, at the outset, of dentists who hold no diploma but can satisfy an examining body of their fitness to practise. They would be termed simply "dentists," while those who hold recognised qualifications would call themselves "dental surgeons." The draft has been criticised on the ground that it is not advisable for the dental board to be established under the ægis of the medical council; feeling is strong among qualified dentists that it should be an independent body. If Bombay is to have the distinction of being the first presidency to establish a dental register, the credit will be largely due to Dr. J. J. Mody, professor of dentistry at the Grant Medical College, who has worked tirelessly to this end, and has already started a dental hospital. The practice of dentistry in India is chaotic, and it will be uphill work to place it on a proper footing. Not the least of the initial difficulties will be the paucity of qualified practitioners and the absence of facilities for training. With the provision of the essential minimum of hospital and school equipment, however, and granted adequate public spirit amongst the small body of available practitioners, it ought to be possible to make a start. Unlike medicine, with its indigenous *vaids* and *hakims*, dentistry has no native Indian exponents, apart from the people who call themselves "tooth-binders," and earn a precarious living by ingeniously tying loose teeth to adjoining sound ones. There are, however, already a number of irregular practitioners on western lines who will have to be eliminated.

The Sarda Act.

The coming into force of the Act to prohibit child marriage has aroused much interest. Minor boys and girls have been married in surprisingly large numbers during the last few weeks, in order to forestall the Act, and instances have occurred of children only a few days old being snatched from nursing homes to be united in the bonds of matrimony. The *Times of India* tells of a girl of three, who was sound asleep in bed when her presence was required for the ceremony, and asked on being awakened that it might be put off until the morning. It remains to be seen whether the new ordinance will be defied on a large scale; a large and influential section, however, of public opinion supports the movement, and experience of other measures of social reform justifies the belief that the measure will eventually be generally accepted as inevitable. An encouraging sign is the enthusiasm of women on the subject. Speakers at the recent All-India Women's Conference in Bombay, and similar gatherings in other parts of the country, have expressed emphatic approval of the Act, and of a Bill which is shortly to be introduced in the legislative assembly to put an end to the practice of dedicating young girls to Hindu temples. At a time when Mr. Gandhi is being denounced as a mere political schemer, it ought to be remembered that the revival in favour of these social reforms is due to propaganda carried on unceasingly by the Mahatma during many years. Child marriage is one of the evils he has constantly attacked.

Vaccination.

It is unfortunate, however, that the Mahatma's recent prejudice against almost everything of western origin has led him to fall foul of important sanitary measures. One of these is vaccination which, of course, plays an even more beneficent part in India than in Europe, and has saved countless lives. It is impossible to argue with him since he attributes many of his views to the promptings of an Inner Voice. The Voice, says the *Times of India*, has now informed him that it is sheer irreligion to resort to vaccination as a preventive against small-pox; it is as bad as eating cow's flesh. This article of faith was recently tested severely when three children belonging to his Ashram near Ahmedabad died one after the other of small-pox, but his conviction remained unaltered. He asks, "if I were to be frightened by these three deaths, of what use would be my faith in God? In the fight that is impending not three but thousands and hundreds of thousands may perhaps have to be sacrificed." And he suggests that this trial has been sent to harden his heart for the civil disobedience struggle.

Bacteriophage in Cholera.

Lieut.-Colonel J. Morison, I.M.S., director of the Medical Research Institute of Shillong (Assam), has had an opportunity of testing d'Herelle's cholera bacteriophage in a hill village epidemic. The outbreak occurred in virgin soil, and the mortality from the first was maintained at a high level, on the ninth day no fewer than seven out of nine persons attacked dying. It is stated that with the introduction of bacteriophage treatment there was at once a change, and Colonel Morison evidently thinks that the treatment was effective. He was associated with Dr. d'Herelle in the early stages of his work in India, and the record of his work in the March issue of the *Indian Medical Gazette* is worthy of study.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Hospitals and Sweepstakes.

THE proposal to legalise the holding of sweepstakes on behalf of charitable hospitals in the Irish Free State has given rise to considerable hostile criticism, and the Bill for the purpose is at present at a standstill. Many religious bodies in particular have been decisive in their disapproval. Last week, however, Sir William Taylor, speaking at the annual meeting of the Coombe Hospital Linen Guild, defended the proposal. He pointed out that, on a conservative estimate, the Dublin hospitals were in debt to the extent of some £130,000. It would take as much more to bring them up to modern requirements. The hospitals had explored every avenue of income, but the fact was that people had not got the money to give. The only means left to the hospitals was the sweepstakes. He did not think there was anything immoral in raising money in this way. Sir William received an unexpected ally in the Very Rev. John

Hannon, S.J., who said that he thoroughly agreed with Sir William's ethical exposition. He knew no ethical reason why sweepstakes should be forbidden; he had nothing but commendation for them if they were not pressed too far. No doubt critics will still ask how, if it is true, as Sir William Taylor says, that people have not got money to give to charity, they still have money to spend on gambling.

The Appeal for Radium.

The Irish Radium Institute, which works in association with the Royal Dublin Society, has recently issued an appeal for funds to purchase an additional supply of radium. Several generous persons have promised guarantees, amounting at present to over £5000, to contribute in equal proportions to sums subscribed in answer to the appeal. It is hoped that at least £12,000 in all may be forthcoming, a sum sufficient to buy one gramme of radium. The radium at the disposal of the Irish Radium Institute is mainly used in the production of emanation which is supplied to surgeons as a therapeutic agent. The Institute rightly takes pride in the fact that the mode of using radium emanation by means of hollow needles, now commonly employed throughout the world, was devised by its workers many years ago. It is to be hoped that the appeal recently issued will meet with a generous response.

A Tribute to Dr. E. C. Thompson.

A tablet has been erected in the Tyrone County Hospital, Omagh, by the hospital board as a tribute to Dr. E. C. Thompson, D.L., who was surgeon to the hospital from 1875 to 1928. The tablet, in addition to appreciative references to his skill, energy, and sympathy, states that "the very existence of the Hospital in its present up-to-date structure and internal condition is largely due to his efforts."

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Health Examinations in New York.

THE first campaign for the promotion of periodic health examinations undertaken by the Five Counties Medical Societies of New York was forecast in a previous letter. It was actually launched last November by proclamation of the mayor. One and a half million leaflets, 21,000 posters, 5000 counter cards were distributed; 30 radio talks and 30 public lectures on periodic health examinations were given; and hundreds of columns of comment appeared in the daily press. The six months' campaign was so successful that a new campaign has been authorised to extend over a full year at a cost of $30,000. Some new features are now to be introduced. These include an investigation of the health educational work now being carried on by industrial and voluntary associations. It is hoped thus to improve the methods of popular education. At the same time an attempt will be made to standardise the health examination in a form that will enable the general practitioner to give the best possible service to his patients. The findings of the research committee will be presented to medical schools in the hope that they may be included in the curricula. To assist physicians in conducting the examinations a monthly bulletin will be issued. Health examination clinics will be held in hospitals and other institutions. The five county societies include a membership of 12,000 physicians.

A Symposium on the Kidney.

The University of Minnesota is organising a short summer course to be held from July 7th–18th on the anatomy, physiology, and pathology of the kidney. No attempt will be made to present the whole wealth of accumulated knowledge on these subjects, but the discussions will rather centre upon recent advances and on those phases of the subject where advance is most difficult and where intensive investigation is proceeding at the present time. A very strong faculty has been assembled, including, besides members of the university, visiting professors from Johns Hopkins and other universities, and from the Mayo Clinic. Prof. Franz Volhard, of Frankfort, will conduct a series of clinics. Several evenings have been set aside for round-table discussions.

Causes of Death from Burning.

The New York State department of health has made an analysis of the causes that led to 314 deaths from burning during the year 1928. More than a quarter of the deaths (27·4 per cent.) were of children under 5 years of age and another tenth were of children from 5 to 9 inclusive. Most of the deaths from bonfires and all of the deaths from matches occurred in these two age-groups. The largest proportion of deaths, but not more than 29 per cent., occurred in burning buildings. The following table shows the number of deaths by age as well as by the responsible agency:

Agency.	Total.	Age in years.		
		Under 5.	5–9.	10 and over
Total burns	314	86	34	194*
Bonfires	22	8	6	8
Corrosive substances	4	—	—	4
Lamps	3	—	—	3
Matches	14	9	5	—
Stoves	59	11	2	46
Scalds	52	37	4	11
Conflagrations (burning buildings)	91	13	8	70*
Other specified means	57	5	6	46
Means not specified	12	3	3	6

* Includes two deaths with age unknown.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 26TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox 353 (last week 345); scarlet fever, 1885; diphtheria, 1175; enteric fever, 69; pneumonia, 1014; puerperal fever, 55; puerperal pyrexia, 98; cerebro-spinal fever, 11; acute poliomyelitis, 7; encephalitis lethargica, 7; dysentery, 6; ophthalmia neonatorum, 106. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on April 29th-30th was as follows: Small-pox, 483 under treatment, 31 under observation (last week 542 and 26 respectively), scarlet fever, 2060; diphtheria, 2635; enteric fever, 27; measles, 1055, whooping-cough, 63; puerperal fever, 30 (plus 16 babies); encephalitis lethargica, 119; poliomyelitis, 1; "other diseases," 19. At St. Margaret's Hospital there were 15 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns including London there was 1 death from small-pox, 3 (0) from enteric fever, 125 (58) from measles, 16 (5) from scarlet fever, 30 (5) from whooping-cough, 27 (4) from diphtheria, 48 (15) from diarrhœa and enteritis under two years, and 48 (4) from influenza. The figures in parentheses are those for London itself.

The death provisionally classified to small-pox was assigned to Finsbury (Met. Boro.). (Another occurring in Nuneaton U.D. during March has now been returned.) The 3 deaths from enteric fever outside London were reported from Enfield, Bootle, and Sheffield. Fatal cases of measles were still widely distributed, with larger numbers at Salford 6, West Ham and Warrington each 5, Willesden and Darlington each 4. Whooping-cough claimed 4 victims at Liverpool and 3 at Manchester. Deaths from diarrhœa numbered 5 at Liverpool and 4 at Manchester. Birmingham and Manchester each reported 4 deaths from influenza.

The number of stillbirths notified during the week was 321 (corresponding to a rate of 46 per 1000 births) including 54 in London.

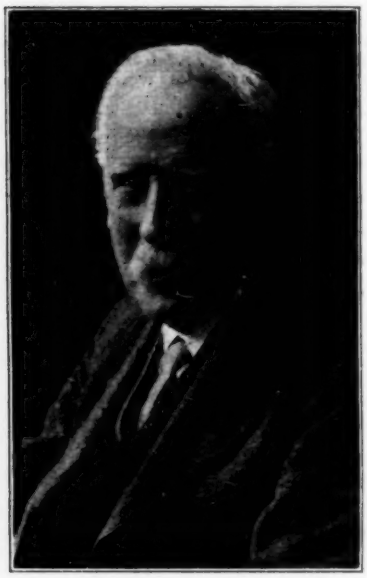
Obituary.

SIDNEY COUPLAND, M.D., F.R.C.P. LOND.,

CONSULTING PHYSICIAN TO THE MIDDLESEX HOSPITAL; LATE MEMBER OF THE BOARD OF CONTROL.

WE regret to announce the death of Dr. Sidney Coupland, which occurred at his house, Wootton Ridge, Boar's Hill, Oxford, on Tuesday, April 29th, in his eighty-first year, after more than a year of complete invalidism.

Sidney Coupland was born in December, 1849, and was the third son of Mr. W. N. Coupland, of Streatham. The family consisted of three sons and four daughters, and the father having met withunmerited business reverses the brothers had to make their own way and coöperate in the support of the family. Sidney Coupland received his early education at Hove House School, Brighton, and proceeded as a medical student to University College Hospital, where the teaching staff included such well-known men as William Jenner, Russell Reynolds, Ringer, Bastian, John Williams, Erichsen, and Christopher Heath. He graduated with honours at the University of London in 1873, and in the next year took the Membership of the Royal College of Physicians and proceeded to the M.D. London. At University College Hospital he held the various resident posts, but he did not wait until a vacancy occurred on the staff but migrated to the Middlesex Hospital, where he was appointed pathologist in 1873, becoming in 1875 assistant physician. On the Middlesex Hospital medical staff he was soon recognised as a sound clinician and an earnest and sympathetic teacher. For a considerable period he was medical tutor in the school, while he edited for four years the medical and pathological reports of the hospital. He lectured on pathology and pathological anatomy and took classes in the wards and out-patient department, where his instruction was recognised as of high practical value. In 1879 he obtained charge of wards, in 1880 he was elected F.R.C.P., and in the following year he delivered the Goulstonian Lectures, which took the form of an elaborate disquisition on anæmia, and in which the general lessons were mostly derived from a study of practice at the Middlesex. He was physician to the Middlesex Hospital for 19 years and during this period he was recognised by his colleagues as a general consultant in the fullest sense of the words. Nevertheless the large range of his clinical work never induced him to write a medical treatise, but his contributions to serial medical literature were considerably numerous, and he published a brief monograph on endocarditis, and some practical notes on the clinical examination of blood and excreta, which were a résumé in relation to his teaching when conducting the autopsies at the hospital. An appreciation of Dr. Coupland is appended from the pen of Sir John Bland-Sutton, and from this the great influence can be gauged which Coupland exercised at Middlesex as learned physician and sympathetic teacher.



DR. COUPLAND.

(Photograph by Lafayette.

From 1889 to 1896 Dr. Coupland was engaged in making reports on various small-pox outbreaks to the Royal Commission on Vaccination, which it may be remembered took evidence for six years after its appointment in 1889. This work made him thoroughly conversant with every side of the vaccination question, and we owe to Sir William Collins, the only surviving member of that Commission, the following account of Coupland's services, with a testimony to his other fine qualities.

Sir William Collins writes:—"As the only survivor of the Royal Commission on Vaccination which sat under Lord Herschell's chairmanship in 1889–96, I wish to testify to the value of the services rendered to that Commission by the late Dr. Sidney Coupland. He not only investigated with great care and impartiality outbreaks of small-pox at Dewsbury, Leicester, and Gloucester, but he also examined and reported on numerous cases of untoward results alleged to have been due to vaccination. Without fear or favour, but simply as the painstaking and accomplished clinical physician that he was, he recorded the conclusions at which he had arrived, irrespective of the partisan contentions which have always encumbered this much vexed question. He commended the 'sanitary vigilance' at Leicester, and attributed to it the restricted spread and the lower fatality experienced there compared with the cases of Dewsbury and Gloucester, where sanitary conditions and hospital provision and organisation were less satisfactory or less adequate. He classified the injurious results from vaccination into those due to the quality of the lymph, those caused by septic infection, and a third category described as 'cases of deranged health, and even serious symptoms evolved by the constitutional disturbance induced by vaccination in weakly or predisposed subjects.' In reference to these latter he suggested that 'unless small-pox were prevalent at the time it might often be preferable to defer vaccination for several months than to adhere too rigidly to the statutory age, irrespective of the condition of the child and its surroundings.' He also deprecated 'the vaccination of very young infants, as is the practice in regard to workhouse children and those born in lying-in institutions.' The relaxations of the compulsory law which have resulted from the Commission's labour were, it is understood, in harmony with the conclusions at which he had arrived.

Besides his official association with Dr. Coupland it was my privilege to enjoy his friendship for more than 40 years. Coming from a Liberal, non-conformist stock, he was alike in professional and other matters ready to listen to any opinion, but determined to judge for himself. Like his brother, Dr. W. C. Coupland, he brought a broad philosophic outlook to bear on all the problems which he encountered, and if from a rather diffident manner casual observers might misjudge him, to those who knew him well he was a true-hearted friend of firm and sterling quality. He was, moreover, a deeply religious man, though devoid and disdainful of affected piety, and he was successively the admirer and supporter of the Rev. Stopford Brooke and of the Rev. John Hunter, of Glasgow."

It was characteristic of Coupland that he should do the spade-work in connexion with movements in which he was interested, and bodies to which he belonged. Thus he was at different times hon. secretary to the Pathological Society, the Clinical Society, and the Epidemiological Society, and occasionally contributed to the debates, always pertinently though with an air of wishing to conceal his knowledge.

On the fulfilment of his period of office as full physician to the Middlesex Hospital he was elected consultant physician, and was simultaneously appointed a Commissioner in Lunacy. This post he held from 1898 to 1914, when, on the institution of the Board of Control, he became a member of that Board, finally retiring from the service in 1921 after a period of more than 20 years' work in the department. One year later Coupland delivered the Harveian Oration before the Royal College of Physicians of London, when he divided an eloquent discourse into two parts; in the first he revived the personality of Harvey for the audience through the reminiscences of Aubrey, while in the latter part of the Oration he dealt with modern progress in the treatment of the insane and the more intelligent study of insanity which marks the psychology of to-day. Probably it was Coupland's high sense of the responsibility of an official position which prevented him recording any of his experiences while in State employment, just as, save in the columns of THE LANCET, he made no public mention of his investigations intended for the Commission on Vaccination. But in the Harveian Oration will be found an eloquent plea for the removal of the stigma which attached, and which still attaches, in the popular mind to the mental patient, insisting on the ill influence of such prejudices as they stand in the way of the diagnosis, and thus of the cure of the early phases of mental disease.

To this brief epitome of Coupland's valuable career a record must be added of his intimate connexion with THE LANCET. Coupland formed the fourth of a small body of advisers who took over the conduct of this paper during the long illness of Dr. James Wakley, the other three being Sir John Tweedy, Surgeon-General Marston, and James Grey Glover. James Wakley succeeded his father, the founder of THE LANCET, in the editorial chair while still a young man, and throughout his career was particularly dependent on his staff. During the closing years of James Wakley's life, and for the next ten years, Coupland was the principal adviser on medicine generally to the succeeding editors, Thomas Henry Wakley and his son the third Thomas Wakley. In that capacity his industry was as noticeable as were his discretion and his wide range of knowledge. He wrote with facility and clearness and especially with a full sense of the importance of the judgments which he was asked to make, and his leading articles form a résumé of clinical progress in the 'eighties and early 'nineties, while his critical estimates of medical literature were rarely found at fault.

Sir John Bland-Sutton writes:—"The death of Sidney Coupland, my friend and former colleague at the Middlesex Hospital, recalls the condition of staff appointments in London hospitals and medical schools 50 years ago. Coupland was trained at University College Hospital, and like many of his friends elected to come to the Middlesex Hospital, where in those days the teaching appointments in the school were held by members of the hospital staff. The apportioning of the lectureships was made on definite lines. In medicine the physicians taught the principles of medicine, the assistant physicians made the post-mortem examinations, taught pathology, and were, each in turn, curators of the museum. I first met Coupland in the post-mortem room, and our relations soon became close. I attended the dead house regularly because he took great trouble in demonstrating the specimens, and in those early days of my hospital career—before surgeons had become familiar with abdominal surgery—the revelations post mortem were of the utmost advantage to men keen on diagnosis. Coupland was not only skilful in conducting an autopsy, but being curator of the museum he prepared specimens exceptionally useful for teaching purposes, or of intrinsic interest for permanent preservation. In this indirect way I obtained special experience in museum technique. Coupland, like his immediate predecessor, William Cayley, was keen in studying cardiac lesions—inherited or acquired—and added a fine series of hearts with valvular lesions to the museum. He did not preserve specimens simply because they were rare, but always with an eye to their utility for the lecture room and for class purposes. In addition, he described the specimens and added the clinical notes in his peculiar but perfectly legible handwriting in the museum catalogue. The same care that he devoted to the pathological department he manifested in the wards.

He was a sound physician, without bombast or conceit; he taught his clinical classes the methods of investigating a 'case,' the manner of using special instruments, ophthalmoscope and laryngoscope, as well as the stethoscope, how to conduct the microscopic examination of urinary deposits, and the estimation of sugar, and the significance of the findings. Being specially interested in the problems of anæmia his clinical clerks soon became expert in the methods of counting blood corpuscles. Anæmia and leukæmia were disorders in which he took great interest. Thus Coupland's practical classes in the wards were of the greatest service to the students. He was most patient in teaching, whether it concerned clinical examination, note-taking, or writing prescriptions. A gross blunder on the part of the student did not evoke any rude outburst or banter, but simply a peculiar nervous titter! In respect of surgical treatment he was progressive, and the surgery of cranial, thoracic, and abdominal diseases equally attracted him. In 1880 he had a young woman under his care in whom he diagnosed a renal calculus, and induced his surgical colleague, Henry Morris, to remove the stone. The surgical intervention was successful. This 'case' is historical; it laid the foundation of renal surgery as we understand it to-day. I was present at the operation, and M. M., the patient, lived many years, and reported herself at the hospital from time to time. As the years rolled on I became Coupland's co-relative surgeon in the hospital, and I remember that he transferred a groom to my ward with an 'iliac swelling.' I operated on the man and removed his vermiform appendix; this was the first example of 'appendectomy' in the history of the Middlesex Hospital.

Sidney Coupland, conscientious as a teacher, was highly self-conscious as a physician; his apparent timidity was inimical to success in dealing with private patients, especially female patients. He disliked strife, was loyal to his colleagues, and devotedly attached to his adopted hospital."

Dr. Sidney Coupland married in 1880 Bessie, daughter of the late Mr. Thomas Potter, of Great Bedwin, Wilts, who survives him at the age of 83, and within measurable distance of their golden wedding. Their marriage was one of unbroken devotion. Prof. Reginald Coupland, Beit Professor of Colonial History at Oxford, is the only surviving son, an elder brother having died as a child from diphtheria, to the abiding grief of the parents.

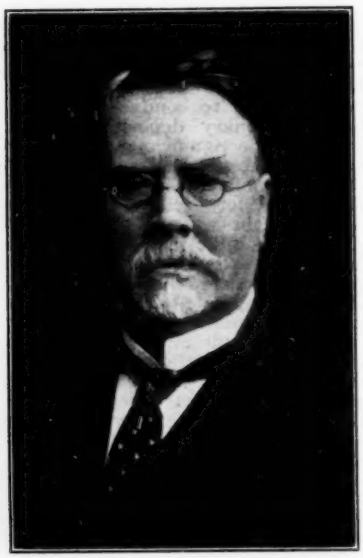
MURDOCH CAMERON, M.D., C.M., LL.D. GLASG.,

LATE REGIUS PROFESSOR OF MIDWIFERY AND DISEASES OF WOMEN, UNIVERSITY OF GLASGOW.

WE regret to announce the death of Prof. Murdoch Cameron, which took place on April 28th in a nursing home in Glasgow in his eighty-fifth year.

Murdoch Cameron, the son of a merchant in Glasgow, was educated at his native University, where he graduated in medicine in 1870, proceeding to the M.D. degree two years later. He made midwifery a study from the beginning of his career, his first post, which was obtained over 50 years ago, being that of physician to the University Lying-in Hospital. In 1878 he was appointed physician accoucheur to the Western Infirmary, having in the meantime become assistant to William Leishman, the well-known Regius Professor of Midwifery in the University, and father of the late Sir William Leishman. In 1888 Murdoch Cameron obtained

the appointment with which his memory will always be associated, namely, that of obstetrical physician to the Glasgow Royal Maternity Hospital, and it was here that he made his reputation as a progressive obstetrician. He found a large and varied clinical field the cultivation of which gave exercise to his boldness, ingenuity, and practical learning. His name was closely associated with Cæsarean section, owing to certain successful operations conducted upon rickety subjects 40 years ago, the introduction of antiseptics allowing for the revival of procedures which had been abandoned because of their fatality; here Cameron's actual training under Lister at the Royal Infirmary—a fact which he recorded in the Lister Centenary celebrations—stood him in good stead.



PROF. CAMERON.

[*Photograph by Annan.*

In 1894 he succeeded to the chair of midwifery in the University on the resignation of Prof. Leishman, and occupied the post till 1926, having therefore been engaged in lecturing to succeeding generations of students, first as assistant and then as full professor, for over 40 years. The authorities of the University recognised the distinguished nature of his services by bestowing upon him the degree of LL.D., and he was elected honorary President of the first International Congress of Obstetrics and Gynæcology which was held in Brussels in 1892.

An official visitor to the Glasgow Royal Maternity Hospital has sent us this vivid recollection of Cameron within the walls of the institution where he spent so much time, and spent it so valuably. He writes:—"The occasion was an annual meeting of the Maternity Hospital Board. Cameron was there waiting to show me over the hospital and I could see that every stone of the building had a significance for him. His real life had been lived there and the structure took, for me, an almost personal meaning as he held forth on its history, explained its development, and showed photographs of early cases. Among these were three cases of Cæsarean section, the first, I understood, to be done in the hospital, if not in Glasgow. The awful history of maternal rickets in Glasgow later made the operation frequent when Cameron's pioneer message was understood. Cameron was full of enthusiasm, which age had not abated (and he was no longer young). When we came to the room where the new-born were first taken to be handled and dressed, he said, as the nurses were coming in twos or threes: 'That's the music!' and then, like a young resident, explained the method of ordering the new babies and labelling them for restoring to their mothers at the correct moment. It was the talk of a man whose whole soul was touched with the successful management of new life and the preservation of the mother."

Prof. Murdoch Cameron was predeceased by his wife for over 30 years, and is survived by one son, Dr. Samuel Cameron, who is obstetric surgeon to the Glasgow Maternity Hospital, and four daughters, one of whom, Dr. Agnes Cameron, is physician to the Stobhill Hospital, while another daughter is matron of the Stirling Maternity Hospital.

EDWARD LAW, M.D. EDIN.,

CONSULTING SURGEON TO THE LONDON THROAT HOSPITAL.

WE regret to record the death of Dr. Edward Law which occurred at Hove on Wednesday, April 30th, in the seventy-sixth year of his age. For many years he occupied a leading place in London as an otologist, and this position was equally allotted to him on the Continent and in the United States. The long period of ill-health which marked his later life has, perhaps, obscured the memory of a distinguished man.

Edward Law was born in 1853, the son of Abraham Law, of Sheffield, and received early education in his native city and his medical training in the University of Edinburgh, where he graduated as M.B., C.M. in 1877, taking the M.R.C.S. Eng. at the same time. After holding certain resident appointments he decided, for health reasons, to accept an appointment as surgeon in the Pacific Steam Navigation Company, and later became a medical officer in the Orient and City Lines, making up a period of some three years in which he was a ship's doctor. He then commenced to practise in Australia, where he resided for two years, at the end of which period, his health having recovered, he decided to return to Europe and to specialise in otology. With this object he spent three years in Vienna where Politzer and other workers along the same line had made their clinics celebrated, and during this period he not only acquired a practical knowledge and expertise that few otologists and laryngologists in this country at the time possessed, but he became a real German scholar and a personal friend of many of the professional leaders in the Austrian capital. He returned to England in 1883 and became house surgeon at the Throat Hospital in Golden-square, where Morell Mackenzie was the leading figure, but in 1887 the London Throat Hospital was founded, and Law, one of the originators of the scheme, became a member of the staff.

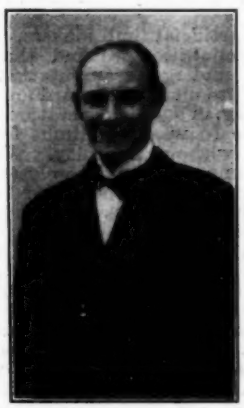
We are indebted to Dr. E. B. Waggett for the following personal estimate of Law as doctor, colleague, and friend. To the sympathetic picture any addition would be superfluous. "For one of his junior colleagues on the staff of the London Throat Hospital which he had helped to found, the outstanding memory of Edward Law is that he possessed the strange faculty of authority; his dictum upon the prognosis of a case of deafness or upon the desirability or otherwise of operation was accepted without question, and the opinions which he expressed at the meetings of the medical societies were always listened to with respect. To-day with the accumulation of 30 years of research and of clinical experience, coupled with precise methods of scrutiny, it is difficult to recall the nature of personal authority; there is no question but that Law exhibited that faculty, and that fact is evidence that he knew all that was known up to date, that he took infinite pains in arriving at an opinion, that he was a close and accurate observer, and that his judgment was both alert and balanced. As the scope of otological knowledge grew he kept up to date (I have by me now his attempt to render intelligible the elaborate work of Barany on the labyrinth), and until his retirement a year or two before the war Law's opinion was sought and accepted in problems where clinical tests had proved indecisive. In a word, Law was an exceedingly good doctor, with the result that he acquired the complete confidence of colleagues throughout the world, and enjoyed a very large and important practice. For reasons of health he took no active part in the development of operative surgery, although during his time at Vienna he had

gained a reputation for unusual skill with the chisel. This fact, coupled with a disinclination for uninvited self-assertion, probably robs him, in the eyes of the rising generation, of the prominent place which he took as a pioneer of precise otology in Great Britain—a place which is certainly accorded him by the generation which was brought up on his translation and edition of Gruber's 'Diseases of the Ear,' the recognised text-book on the subject in this country for many years.

"If Law was an example of the best type of doctor, the man who devotes all his consideration and all the knowledge available to the welfare of his patient, he was also the best of colleagues and the best of friends. Many of his juniors must be able to recall personal experiences of the working of his generous nature; clinical difficulties surmounted by his unostentatious advice; credit due to his judgment thrust by him upon their shoulders; the confidence of patients restored where cases threatened to go awry. Before ill-health overtook him nearly 20 years ago, Law was vivacious, witty, a good sportsman, and the centre of a circle of close friends both in and outside the profession. All this does not account for the affection he inspired in his closest friends and in a remarkable degree in his old patients. Those who knew him well will agree that in some singular fashion he was a particularly lovable person; he was kindly, courteous, straightforward, a staunch ally, and completely unselfish, but I think that his peculiar attraction must lie in his capacity for loving his friends."

HUBERT JOHN BURGESS FRY, M.D., B.Sc. OXF., D.P.H.

Dr. H. J. B. Fry died on May 5th, having been ill only for two or three weeks. He was a pathologist of standing who for the last eight years had specialised in cancer research and had taken a prominent part in the organisation and activities of the British Empire Cancer Campaign. Dr. Fry was born in India in 1885, and educated at Charterhouse, Magdalen College, Oxford, and St. Thomas's Hospital. He was a distinguished student, obtaining an exhibition in science at his school and at his college, and taking a degree in natural science with first-class honours in physiology. After graduating he was appointed to a university biological research scholarship at Naples, and worked there at the thesis which gained him his B.Sc. He returned to England and attached himself to St. Thomas's Hospital, whence he graduated in medicine in 1911, taking his M.D. in 1914. He became resident house physician and then casualty officer at the hospital, and served as clinical assistant in four different departments before he specialised in pathology, becoming demonstrator and Jenner Research Scholar, and later assistant director of the pathological department. On the outbreak of the war he joined the R.A.M.C. (T.), and served in France for some time as a regimental medical officer and at a casualty clearing station. He was mentioned in despatches and later was withdrawn to the base to do special pathological investigations, notably in influenza and on the treatment of septicæmia. For four years after the war Dr. Fry worked as bacteriologist in the Central Laboratory of the Ministry of Pensions, and in 1922, when the pathological departments of the Cancer Hospital, London, were being reorganised, he was appointed pathologist to the Research Institute of this hospital. Realising the importance of reliable tests for the diagnosis of cancer, he began an investigation into the various serological tests which had been described and developed a new flocculation test which gave a high percentage of correct results when applied to cases of cancer. He made no claim that the test was specific for cancer, but with characteristic thoroughness and caution he studied the conditions responsible for the reaction. He found that they were due to cellular degeneration, and could demonstrate that if certain other conditions associated with cellular degeneration, such as syphilis and tuberculosis could be excluded, the test was a valuable aid to the diagnosis of cancer. The advances made by the experimental study of carcinogenesis attracted his attention to the relation of trauma to cancer, and at the International Cancer Conference held in Paris in March, 1930, on the occasion of the opening of the new cancer centre in Villejuif, he communicated the clinical material which he had collected bearing on the question of cancer arising in the scars of war wounds. Dr. Fry served on several committees of the British Empire Cancer Campaign, and was largely responsible for organising the International Cancer Conference held in London, in 1928. He was a member of the Editorial Committee of the *Cancer Review* from its inception, and the standing which this journal has acquired during the five years of its existence is largely due to his efforts.



DR. FRY.

Soon after his appointment to the Cancer Hospital, Dr. Fry left London to settle in Welwyn Garden City, where his wife, Dr. Gladys Miall Smith, started in general practice. He took an active interest in the development of garden city ideals, and was a popular and prominent member of the local community, becoming a J.P. of the county of Herts.

The honesty of his purpose and the charm of his personality endeared Dr. Fry to all who came into contact with him, and wide sympathy will be felt with his widow and children in their loss.

Prof. Archibald Leitch writes:—"Our minds are benumbed by the loss of our dear friend and colleague. Everybody who had any acquaintance with him would realise his outstanding qualities and those of us who were in constant association with him regarded him with affectionate admiration. He seemed to have all the good qualities. Though uncommunicative about himself he had a charming genius for friendship, and though he held strong views on politics and social affairs no one could possibly quarrel with him. He was sincere and he was thorough in everything that he did. It was fortunate for me to gain his friendship during the war and doubly fortunate to get him as a colleague afterwards. His published papers indicate the scope and the extent of his laboratory work but they represent only a fraction of his investigations. He crowded more into a day than anybody else I knew. When there was a temporary lull in the work of the pathological laboratory he filled the time with experiments in the animal room, mainly on immunology, or he made abstracts from foriegn scientific literature, or he attended a committee meeting. His life was strenuous but never hurried. The municipal affairs of Welwyn Garden City, where he was a magistrate, occupied some of his evenings. On Saturday afternoons he played football, hockey, or tennis, or he rode a horse; he was an all-round athlete—a good cricketer, a good swimmer. I used to tell him in a chaffing way that he ought to give up Association football at his time of life, for he was 44, but he was physically strong and apparently fit. I wonder if he did not tax his energies too much, so that when an acute illness came it found a tired body. His scientific abilities were great, but far more than that, he was a real man."

The portrait is from a group photograph taken at the Paris conference in March.

THE LATE MISS M. B. WILLIAMSON.

THE Royal Society of Medicine owes a debt of gratitude to Miss Williamson, who was attached to its secretariat for over 30 years. It was in 1904 that she joined the permanent staff of the Royal Medico-Chirurgical Society under Sir John MacAlister, to whom she had already acted for several years as temporary assistant. Three years later the Royal Society of Medicine was founded, and through the crowded and difficult times of preparation, negotiation, and completion Miss Williamson was the right hand of the secretary and honorary officers. Again in 1911, when the new house at 1, Wimpole-street was being built, and in the following year when the books and other effects were being transferred there from 20, Hanover-square, it was on Miss Williamson that the organisation fell. And finally, when in the war period of 1914–18, many of the staff and honorary officers were on active service, her unflagging energy and cheerfulness carried through tasks which might well have discouraged a less ardent spirit. In 1925 a special resolution of gratitude and appreciation was passed by the Council for her fine service, and it was fitting that the memorial portrait of Sir John MacAlister should have been unveiled by her hand.

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Dr. Donald Davidson's death at Plymouth, where he was port medical officer, cuts short a promising career in the public health service. He qualified from King's College, London, in 1922, and had recently taken the highest medical qualifications. His contributions to the *Medical Officer* showed uncommon wit and wisdom, and his loss is felt among a wide circle of friends.

Correspondence.

"Audi alteram partem."

A UNIVERSITY DEGREE FOR THE GENERAL PRACTITIONER.

To the Editor of THE LANCET.

SIR,—The correspondence in your columns on this subject encourages me to make an appeal on behalf of a smaller band of medical men who find themselves the victims of the very rigid and unreasonable regulations of the London University. Every year a number of colonial students, many of whom have completed their pre-clinical training at a Dominion university, arrive at this world centre to pursue their hospital training. Many of them are unaware of the obstacles that await them in the way of non-recognition of their colonial matriculation or their qualifying examinations in the pre-clinical subjects (I was completely misguided by the dean of one of the largest medical schools in London with whom I had corresponded from abroad), whilst others decide to proceed with the Conjoint diploma, not recognising at the time the full significance of a medical degree, or being forced that way by financial considerations.

The general practitioner feels the loss of a degree only mildly as his patients are little concerned with his academic qualifications, but the would-be consultant and the man interested in public medicine finds an almost insuperable barrier and he is irrevocably doomed to the restricted field of a non-university man. Even the M.R.C.P. qualification which, when combined with the M.B., B.S. of a recognised university, constitutes the open sesame for the more desirable hospital posts is usually quite ineffectual in itself.

That the M.D. London should be attainable on the standard suggested by "M.D., M.R.C.P." would mean a definite lowering of the status of the degree such as would be undesirable. Exemption from the Matriculation examination and the first and second qualifying examinations, however, could be and should be granted more readily upon presentation of other qualifications or indications of an acknowledged standard, not necessarily university degrees, permission being granted to sit for the final examination for the M.B., B.S. in the ordinary way, from which the M.D. or the M.S. would be obtainable.

Life is too short to allow one to return for two or three years to the dissecting room and the laboratory, but six months of study which gave promise of a university degree of standard would be acclaimed by all who were eager to gain that status.

I am, Sir, yours faithfully,

May 4th, 1930. M.R.C.P. Lond.

AMPUTATIONS AND ARTIFICIAL LIMBS.

To the Editor of THE LANCET.

SIR,—The report in your issue of April 12th (p. 807) of the discussion at the Section of Surgery of the Royal Society of Medicine is of special interest to those who recognise the value of the opinions of surgeons at Roehampton who have seen the after-results of thousands of amputations. Artificial limb makers will welcome an opportunity of noting the effects of amputation in war cases and comparing them with similar operations in civilian cases. This applies with emphasis to the value of the Syme, Stokes-Gritti, and other operations through knee- or ankle-joint. It was probably impossible for surgeons to give definite statistics of the number of these cases which required reamputation during the succeeding ten years, but in civilian cases the problem is very different. In war cases the Syme amputation was largely a sequel of gangrene from frost-bite, and in the knee-joint amputations there were complications from sepsis. The original amputations were often hurriedly done, involving subsequent operations. In civilian cases, on the other hand, complications are only to be feared in cases of tuberculosis, and at the present day the trouble is generally eradicated in the amputation.

From our own records as artificial limb makers, of a hundred cases of Syme amputation we find that not a single case had to undergo reamputation, and the wearers of the limbs are undertaking arduous duties on railways, at the docks, in building operations, and so forth; they continue to wear the limbs for ten, twenty, or more years, without difficulty. We have the same experience of amputations at the knee-joint providing an end-bearing stump; the power to take pressure on the extremity encourages the wearer to engage in tasks which involve long periods of walking or standing. In all these cases we consider it essential that the stump shall fit snugly in the socket at the extremity, as in limbs which permit of a loose movement of the stump, either in the socket or on the end-bearing, there is danger from resultant friction. We consider that, even in the war cases, some of the trouble has arisen from imperfectly fitted limbs or from alteration in the stump after the artificial limb was applied, and that the number of these cases is now very small.

The coöperation and advice of the operating surgeon is of the highest value to the limb maker, and it is by consultation together that the most perfect results are attained.

We are, Sir, yours faithfully,

W. R. GROSSMITH, LTD.,

12, Burleigh-street, W.C., April 26th, 1930.

A POSTAL WORKERS' BED.—Postal workers in all departments between Durham and Berwick-on-Tweed have collected £1000 for the endowment of a bed in the Royal Victoria Hospital, Newcastle-on-Tyne. The money has been provided in three years by voluntary deductions of pence from the wages of the contributors.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

DEBATE ON THE MINISTRY OF HEALTH VOTE.

Mr. Greenwood's Introductory Speech.

ON Tuesday, April 29th, the House of Commons went into Committee of Supply on a vote of £12,724,200 for the salaries and expenses of the Ministry of Health, Mr. R. YOUNG in the chair. The early part of a speech by Mr. ARTHUR GREENWOOD, Minister of Health, in introducing the vote, was reported in THE LANCET last week. Mr. GREENWOOD continued:

THE HEALTH SERVICES.

Maternal Mortality.

Unfortunately the problem of maternal mortality remained and during the last five years there had been a slight increase in the rate. That was serious. A special committee has been appointed by Mr. Neville Chamberlain when Minister of Health to consider this complex problem, and that committee had, among other things, been examining in detail individual maternal deaths, and out of that investigation he believed new light would come bearing on this subject. He hoped that within the next month or two the committee would issue an interim report. The Departmental Committee appointed to consider the working of the Midwives Act, with special reference to the training of midwives, reported not long ago, and their main recommendation was that a national maternal service should be instituted based on insurance principles under which necessary medical services should be provided as part of the medical benefit under the National Health Insurance Act; and the aim of the service would be to provide for more women proper attention during confinement with a view to reducing the rate of mortality. These matters were now under the consideration of the Government with a view to devising a scheme of maternity service which would have due regard on the one hand to maternity benefit under the Insurance Acts, and on the other to the services provided by local authorities under the Maternity and Child Welfare Act; for he was convinced that this complex problem would only be solved by utilising every means at their disposal.

Tubercle and After-care.

With regard to tuberculosis it was good to know that there was still a declining death-rate but more remained to be done. It was clear that a great deal had been done by sanatorium treatment and that more or less permanent cures had been effected and people after full treatment had been able to resume normal life and employment. But, unfortunately, in many cases a patient who had had sanatorium treatment could not well go back to the rough-and-tumble of ordinary life and ought to lead a sheltered life for a period. No doubt in most cases he had no financial resources, and unless cared for there might be a relapse and he might become a source of infection. In the past the tuberculosis campaign had had two objects in view; in the first place, the prevention of infection by the earliest possible discovery, and secondly, the provision of adequate treatment with a view to a cure of the disease. In the Public Health (Tuberculosis) Act, 1921, power was given to counties and county boroughs to make arrangements for the after-care of persons suffering from tuberculosis. Something had been done, but the fact that treatment seemed to be more urgent and that hitherto expenditure on after-care did not rank for grant as provision for treatment did, had no doubt deterred local authorities from making after-care provision.

The time had now arrived to press this question of after-care a little further. The financial provisions of the Local Government Act had obliterated any distinction between grant-earning and non-grant-earning services of local authorities. The fact also that public health authorities, county councils, and county boroughs were now public assistance authorities would lead them to see that it was cheaper in the long run to do all they could to restore people suffering from tuberculosis to wage-earning employment rather than allow them to fall on the funds of the public assistance committee. Something had been done by means of village settlements, a few of which existed in this country, the two most important being the settlement of Papworth, in Cambridgeshire, and Preston Hall, in Kent. The primary object of these establishments was to provide tuberculosis patients who had had treatment at a sanatorium with remunerative employment suitable to their physical condition and regarded as part of the cure, and as a means of bringing them back to a position of relative economic independence. These settlements had been more or less successful. There was a hospital section where cases are studied, where they were passed into the sanatorium when ripe for treatment, and where a certain amount of training could be undertaken under strict medical supervision. Then there was the training section where patients were sufficiently recovered for them to undertake definite instruction as part of their treatment, as well as with a view to fitting them for the industrial section of the settlement, and there was the industrial side of the settlement where a man had sufficiently recovered to work, say, six hours a day, and where he could not be driven but where he could employ himself for wages on work suited to his physical condition, where he could be watched and removed if his condition became worse. Those experiments were hopeful, and the experience of the existing settlements and the principles on which their successful working depended had been brought within the last few months to the notice of certain local authorities where, it seemed to him, conditions were favourable to the successful establishment and maintenance of similar establishments. He hoped that before very long the number of village settlements for tuberculous persons would be increased. Even if they were able to provide settlements for all those for whom settlements would be appropriate, they would still be left with a number of people who would require after-care, following on sanatorium or other treatment. He hoped that the local authorities, as the next move in the campaign against tuberculosis, would consider and experiment in methods of after-care for tuberculous persons.

THE POST-GRADUATE MEDICAL SCHOOL.

Less than three weeks ago he had announced in the House that the Government had agreed to make a contribution of up to £250,000 for buildings in connexion with the proposed post-graduate hospital and medical school, and although no money was being asked for under that head, in the present estimate, it seemed necessary to say something about it. The Government contribution was for the buildings, but increased grants would in future be given through the University of London when the school became a recognised school of that university. The publication of the scheme had been received with unanimous approval in both the lay and the medical press. He had since communicated with the London County Council and the University of London in order to get their coöperation in the scheme. That coöperation was necessary, and he hoped now, that in a very short time, they would have completed the next step in the process by the appointment of a fully representative committee representing all the various interests concerned, to consider the very complex problems of planning and administration and so on which must be solved before the scheme could be brought into operation. He believed that this was, perhaps, the most important single step which this country had taken in the interests of public health since the passage of the original Health Insurance Act, because, not only would this be a centre for post-graduate teaching for people from other parts of the Empire, but it would enable the general practitioners of this country, including the 16,000 panel doctors who served the State under the National Health Insurance Act, to have the chance, which they did not enjoy to-day, of keeping in touch with the rapid developments and changes which were taking place day by day in the art and the science of medicine. One looked forward to seeing after it had been at work a great improvement in the service which the medical profession would be able to provide for the people of this country.

Dr. VERNON DAVIES: Will the total expense of the post-graduate course be borne by the medical men themselves?

Mr. GREENWOOD: No; I hope that we shall have a certain amount of provision made to assist them. Proceeding, the right hon. gentleman referred to the question of psittacosis. In this country up to the present time they had known 115 cases of which 22 had been fatal. All of them were not associated with the importation of South American parrots; some of the cases were associated with African parrots and others even with love-birds. On account of the seriousness of the problem the Ministry in February issued a memorandum giving advice and suggestions to the public and arranging for coöperation between the medical officers of health and the medical officers of the Ministry in investigation work. That work had been going on and a comprehensive report on the whole question was now being prepared in the department. Meanwhile, events had made it imperative that action should be taken under the Public Health Acts to prohibit the importation of parrots for the time being. The date, May 20th, had been fixed in order to give sufficient time to warn people who might be on the point of importing parrots

Discussion on the Vote.

Sir KINGSLEY WOOD said that he did not think Mr. Greenwood had shown a sufficient grip of the present position in regard to the National Health Insurance Scheme. It was a matter of considerable anxiety to the approved societies and the many thousands of administrators engaged in the work.

The Position of National Health Insurance.

The position was, he said, so serious that if it was continued it would undoubtedly threaten the surpluses of the approved societies and the additional benefits, and particularly the hope of an expansion of benefits in the future. He (Sir Kingsley Wood) did not say that the finances of the scheme were not in a thoroughly strong position and that they had not large reserves—he thought the surpluses at the last valuation amounted to some £65,000,000—but it was a very surprising thing that they should have this revelation given in very impartial terms by the Government actuary of the very great rise in these claims. He did not think it was an exaggeration to say that during the term of the National Health Insurance Act no less than £100,000,000 had been spent on medical treatment and attendance during 17 years; and when they remembered that nearly £500,000 was being disbursed each week in cash benefit, that nearly £2,250,000 per annum was being expended on drugs, and that some 15,000 members of the medical profession gave 60,000,000 attendances every year to insured persons, it was a most surprising thing that they should have this statement of the Government actuary. There was another very serious side to the matter. It was particularly surprising when one recalled the great improvement in national health generally. There had been a very remarkable decrease in infantile mortality; he thought that in 1928 it was the lowest on record. The same thing could be said of the tuberculosis death-rate, and he thought it was Sir George Newman who said that 1928 was, perhaps, the healthiest year in the history of this country. Notwithstanding all that they had a record in regard to sickness and disablement claims which, in the words of the Insurance Comptroller, constituted "a challenge to all who are responsible for the welfare of the scheme." It was doubly a matter of anxiety because these increases had been continuing for so long. He noticed that in connexion with the percentage of claims to expectation in 1921, the sickness benefit claims for men were 76, and in 1927, the last available date, they had risen to 107. The figures in connexion with married women were more surprising still, because in 1921 they were 63, and by 1929 they had risen to 130. The figures for disablement benefit were more remarkable still. In 1921 for married women the figure was 66, and in 1927 it had risen to 171. From the summary of the report they found that comparing 1921 and 1927 the claims of men in respect of sickness benefit had risen by 41 per cent., the claims of unmarried women by 60 per cent., and the claims of married women by 106 per cent. The claims in respect of disablement benefit were even more disturbing. The claims of men had risen by 85 per cent., of unmarried women by 100 per cent., and of married women by 159 per cent. It was doubtless true that there was a changed standard of medical treatment and that there had been influenza epidemics. A comprehensive scheme of national health insurance such as this covered very many cases of poor physique and of persistent ill-health, and undoubtedly the prolonged spell of industrial depression had played its part in these figures, but no one could say that that was the end of the story, or that it by any means accounted for the position in which the national health insurance societies found themselves at the present time.

Lax Certification.

The Minister of Health would have to direct himself, he said, more closely to the position. After all he was mainly responsible for the medical services under the Act, for the approved societies were not concerned in it. They were given no right of interference with the medical profession. One was driven to the conclusion after reading these reports and the statement of the Government actuary that there was a good deal of lax certification. The panel practitioner was in a considerable difficulty; he had to decide when a man presented himself whether he was ill or not, and it was a considerable responsibility to refuse a certificate. It was a remarkable thing, however, and according to the Insurance Comptroller directly cases were referred from the panel practitioner to the regional medical officer, some 55 per cent. to 65 per cent. immediately declared off the fund. That undoubtedly called for some further explanation from the medical men who were engaged in this work. One could not say what proportion of these sickness claims were improper claims, but whatever the amount—and undoubtedly there was an amount—a considerable part was due to the alteration that had been made in the period in which an insured person was enabled to change his panel doctor. There was considerable danger in the relaxation. Medical men themselves have said, "How can you expect doctors to refuse certification—everyone being human—when they are faced with the position that if a certificate is refused the insured person can immediately go to another doctor?"

Dr. MORGAN: What body of doctors have ever said that?

Mr. PERRY: Surely the right hon. gentleman recalls that we often had numerous complaints from insured persons about the difficulty of changing doctors under the old system.

Sir KINGSLEY WOOD said they had gone to the other limit now. Undoubtedly there could be a considerable improvement without interfering with the proper rights of insured persons. It was a difficult position, but it would be a great deal worse but for the approved society system. He trembled to think what would be the position if they had one big State scheme.

The Reflex of Unemployment.

Sir DONALD MACLEAN said that it was extraordinarily easy to take prejudiced views about the increase in health insurance claims, and to miss the real issue which was raised by the remarkable increase in notified invalidity. On one thing at least they could congratulate themselves, and that was that there seemed to be no likelihood of the insolvency of the Health Insurance Fund. At the last valuation, about five years ago, there was a surplus of £65,000,000, and he had yet to learn that that huge sum had been substantially reduced. He quite agreed with the reasons put forward by the Minister for some of the increased number of claims. He did not deny that advantages were taken in many quarters of the facilities for getting sickness benefit; but following the year 1926, which started a period of great social difficulty for this country with an immense amount of unemployment, they had as an inevitable reflex of it a decline in the vitality of millions of the population. He thought that the attitude taken by the Minister was the correct one. What was required at present was an intensive internal examination into the whole problem by the sub-departments concerned.

Post-graduate Medical Study.

The announcement which was made the other day, he continued, in regard to post-graduate medical study, was one of the most important projects which had been undertaken for many years. The most brilliant medical men in this country had been forced to make a practice of attending what were practically post-graduate schools in Vienna, Berlin, Paris, and one or two other centres on the Continent. Some of them had even attended one or other of the wonderful schools in the United States of America. This country possessed the most capable, efficient and progressive body of medical men in the world. The research work which was accomplished so quietly in this country needed to be much more widely and fully utilised, not only for the benefit of our own practitioners, but for those who wished to come to this country from abroad. When crossing the Atlantic two years ago he made the acquaintance of an American surgeon of the highest standing. He told him he was coming over for six weeks, and was going to France to attend a post-graduate school. He would very much like to have the opportunity of seeing what was being done in this country, but there was no centre to which he could go. Knowing a great many medical men, he (Sir Donald Maclean) was able to put this surgeon on the right track. He went to the Continent, but stayed only a few days, and hastened back to London. He told him afterwards that the time he had spent away from London he regarded as wasted, because here he could obtain the most valuable information, and had seen very remarkable operations and some of the best research work in the world. He (Sir Donald Maclean) hoped that with the hospital arrangements which were being made at Hammersmith they would be able to establish a school the benefits of which would be felt not only here but throughout the Dominions. Quite recently a Committee appointed by the British Medical Association made a tour of Australia and New Zealand. He had received a letter from the immediate past president of the British Medical Association, in the course of which he said:

> "On my visit to Canada and my recent tour to the branches of the British Medical Association in New Zealand and Australia—notably the Congress at Sydney as well as at Brisbane, Melbourne, Tasmania, Adelaide and Perth, and again in Ceylon, Bombay and Cairo—I was profoundly impressed by the constantly reiterated inquiries as to the prospects of the establishment in London of well-organised facilities for post-graduate study and research. I believe the scheme submitted will go far to meet this urgent demand from our medical colleagues throughout the Empire—at home as well as overseas—and that in its fuller developments it will constitute London, what she should long ago have become, a world medical centre for post-graduate work of the highest standard."

Causes of Increased Claims on Approved Societies.

Mr. RHYS DAVIES said that the first cause of the increase of health insurance claims was the destruction of a million of the fittest men of this country, and the maiming and bruising of millions in the great war. The disabled ex-Service men, unless they received a 100 per cent. pension from the Ministry of Pensions, came on the funds of the approved societies. While he agreed entirely in regard to the point which had been made about excessive certification by panel practitioners, there was one thing to be said in favour of medical men, and that was if a patient went to a doctor and complained that he was not well, he (Mr. Davies) knew of no medical man, however eminent, who could challenge that statement. It was alleged that when a young man came out of a university properly trained as a doctor, in order to build up a practice successfully and quickly he descended to issuing certificates in competition with other doctors. That was the allegation; whether it could be proved or not he could not tell.

Dr. MORGAN: It cannot be proved.

Dr. VERNON DAVIES: Of course not!

Mr. DAVIES said that anyhow he could give the medica Members of the House proof from his office that they had a medical certificate stating that a man was incapacitated from work when he was actually dead. How they were going to get over this difficulty he did not know. No committee in the world could do it. The Minister was right in making an investigation by way of a special medical examination. Rationalisation and speeding-up in industry had, in his view, been one of the greatest causes of the increase in the claims on approved societies' funds. He was not sure that societies had a proper system of sick visitation. A strange thing about this scheme was the more drugs people took the longer and oftener they were ill. The number of chemists' prescriptions in Manchester increased from 1,500,000 in 1924 to 2,250,000 in 1929 for approximately the same insured population, and still there were more sick than ever. There was no malingering except in respect of about 1 per cent. of the insured population. When they remembered the epidemics that had taken place almost every year, the lowering of the vitality of the people consequent on unemployment, especially in the mining districts, the effects of the war, and all those forces which were at work, it was not surprising the claims were heavy. But he trusted as a result of the debate they would be able to find out, not merely how to decrease the number of claims, but how to put the scheme once again on a sound actuarial basis.

Mortality-rate Down and Sickness-rate Up.

Mr. MELLER said that Mr. Rhys Davies had contended that as a result of the war there were a number of men maimed in body who would yield to any attack of sickness. If that were true they would expect to find the increase shown somehow in the ages between 34 and 50. But if they referred to the Government Actuary's report they would find that between 16 and 19 the percentage was 14 in 1921 and 24 in 1927. On the other hand, between 35 and 39 the percentage in 1921 was 13 and in 1927 21. They could therefore dismiss war disabilities as the probable cause of the increase. There had been epidemics of influenza and one would have expected in the period 1921 to 1927 some years in which sickness experience would have dropped very rapidly indeed. Instead of that they found the peak of one year becoming the low point of the following year. There was a gradual increase with apparently no reason for it. The Government Actuary showed, not that there had been a marked lengthening of the periods of incapacity, but there had been a broadening of the area of the people who came upon the sickness funds. The mortality-rate had dropped from 13·2 per 1000 in 1918 to 9·9 in 1928. How was it that medical treatment gave that remarkable decrease in the mortality-rate and a remarkable increase in the sickness-rate? Was this country raising a puny race, who in the old days were prepared to throw off comparatively slight ailments and carry on, but to-day were falling at the very suggestion that there was anything wrong? It was said that during the past year some 400,000 cases were referred to the medical referees. Of that number some 45 per cent. either declared off or failed to attend for examination; some 35 per cent. were found incapable of work; and the balance were found capable of work. It had been said by some medical men that the standard of examination of medical referees was different from the standard of examination of medical practitioners. There might be a difference of view between the practitioners and the referees. But it was a sad reflection that over a period of years the percentage of persons found capable of work by the referees had been certified—it might be for days or even weeks—by the panel doctor to be incapable of work. The inquiry which the Minister contemplated might throw some light as to whether there was a discrepancy between the methods adopted by the medical referees and those adopted by the panel doctors It was clear that every person who was entitled to benefit under this scheme should get benefit, and there ought not to be a differentiation in treatment by any of the medical practitioners. It was a striking thing that the recovery from long illness seemed to take place more rapidly when the value of the benefit was reduced. The inquiry which the Minister contemplated would at least show to the medical profession that this subject was being closely watched, and that doctors had to do something more than merely certify; they had to certify with proper care and precaution. If that debate did nothing more than bring doctors to a realisation of their duties it would have done something. In his view, whatever else the inquiry might find out, they would discover that they had to get back to the old method of transfer from one doctor to another.

THE MEDICAL VIEW.

Dr. MORRIS-JONES said that he understood that the Minister of Health could not touch on many important aspects of administration of the Department, but he was sorry that he did not mention one important matter, the question of vaccination. That matter affected medical and lay circles in this country, and would have to be faced. There were also international obligations associated with it. They saw this a very short time ago, when there was an epidemic in this country, and when a neighbour across the Channel raised difficulties with regard to people arriving there from this country. He hoped that the Minister of Health would face this matter. At present the administration of the law with regard to vaccination was almost farcical. If it was the opinion of the Government that vaccination should be compulsory, it ought to be made compulsory. At any rate, if the Government did not agree in that sense, steps ought to be taken to abolish compulsory vaccination.

Voluntary Services on Public Bodies.

He wished to say a few words in regard to the effect of the Local Government Act of 1929 on a large number of men and women who had been giving voluntary services on some public bodies. He was rather sorry that the late Minister of Health, who initiated and carried out that very great Act, had prevented a large number of public-spirited citizens from giving their services to local bodies on account of the fact that they would have to resign appointments which they had held for many years and which financially brought them very little benefit, but which under the Act they would have to give up or give up their voluntary services on a public body. In his own municipality—he spoke about medical men because he happened to know them better—it affected men and women who gave their services to local bodies. There was the case of a parish doctor who had been on the County Council since the beginning of that authority. Under the Act he had to take the choice of resigning an appointment which he had held for 30 or 40 years or resign his membership of the local authority. It was a pity that the right hon. gentleman did not preserve this great tradition of public service. Not only had these people to make the choice now as to whether they would give up their appointments or resign their membership of a public authority, but they knew that if they gave up their appointments and continued to serve in a voluntary capacity on the public authorities they would lose all superannuation payments, towards which they had contributed over a series of years, as well as the State contribution. It was an injustice that these men and women, who had given services for a great proportion of their life-time, should now, because they might choose to continue their voluntary services to the State, be deprived of the superannuation towards which they had contributed for a large number of years. He hoped that the Government would be able to find a way of redressing this anomally.

Industrial Depression the Cause of Sickness.

A matter which had received public notice was that of the large number of claims under the National Health Insurance Act. The Minister of Health had referred to some of the causes of this increase, and Mr. Rhys Davies, who had had very considerable experience in these societies, also analysed some of the causes. He agreed with Mr. Rhys Davies that the main cause was the serious industrial depression since the war. There were amendments of the National Health Insurance Act whereby persons who were unemployed were still able to retain their rights to medical benefit. By going to the employment exchange and having their cards checked, they were able to continue to receive medical benefit. It was perfectly right that they should continue to receive medical benefit. Although the payment of that benefit might result in the depletion of the funds of the approved societies, it would not be fair at a time when the insured persons were the subjects

of enforced idleness, due to no fault of their own, that they should be deprived of medical benefit. From his experience as a medical man he found that enforced idleness, enforced unemployment, was bound to cause more sickness. The man who was working was much healthier than the man who was not working, and the same remark applied to a woman. A person who had nothing to do except to analyse his own slightest symptom was in such a frame of mind that a small symptom which would not receive any notice at a time when he was working was magnified when he had nothing to do but to think about it. This was a very potent cause of the increased number of claims for sickness benefit. There were, of course, other causes. There was the war, and the increased illness as a result of the war, even among those who did not participate as combatants. In the course of some years' experience under this Act, people had come to consult him or he had had to attend people who did not take any part in the war, but who, nevertheless, were suffering very seriously from having gone through that great catastrophe. Many insured persons had suffered from the bombing that took place in London. It was no exaggeration to say that there were hundreds of people in the County of London who, since the war, were directly or indirectly suffering as a result of the experiences which they went through at that time. There was another reason for the increased claims. He agreed with Mr. Rhys Davies when he said that 99 out of every 100 national health insured were honest, hard-working people, but that 1 per cent. were malingerers. He had had experience of persons who had come to him as a medical man under the Act, and had said: "We have been paying long enough." One person said to him: "We have been paying to Lloyd George for years, and it is time that we got something out of it."

The Difficulties of Certification.

He wished to say a few words in regard to the alleged laxity in giving medical certificates. The giving of medical certificates was a very difficult matter. Medical men were neither worse nor better than any other class of human creature, certainly no worse, and he did not suppose they were any better. They were confronted day by day with very great difficulties under this Act. One Member had mentioned in the dabate that a young medical man, newly qualified and anxious to build up a practice, would be rather keen to please his patient, and therefore he would possibly give a certificate when it was not really required. Quite possibly that might be the case, but he thought that such cases were very rare. It was an extraordinarily difficult thing to tell when a man was or was not capable of work. One of the most difficult things in the world was to prove that a man was not ill. There was a story told of a medical man who dealt rather cleverly with a man whom he knew was very definitely malingering. The man was making a very substantial claim on a railway company as a result of a railway accident. He stated that the pain in his back was so great that he could not stand upright. He walked into the doctor's consulting room bent on two sticks but the doctor had no doubt on the question of the man's capacity. As the man was bent in front of him, the doctor said "I can see that you are unable to stand upright on account of the pain in your back. Would you mind showing me how you used to stand before you met with your accident?" At once the man stood upright. There were occasions when one was able to find out whether or not a man was really ill, but generally it was very difficult. There had been cases known of responsible medical men, of great experience, pronouncing a man fit, and that man had died the same day. Medical science was not an exact science. There were very grave doubts in regard to many ailments. Certain possibilities of a very grave character did not show on the surface as obviously as they did in other cases.

Increasing Standard of Treatment.

On the whole, they saw from the report of the Ministry of Health and the statements made by the chief medical officer to the Ministry that the general standard of treatment under the Act had improved, and that great blessings had been conferred on the community. The claims on the service were constantly increasing. He was certain that the steps taken by the Minister of Health to inquire searchingly into the cause of the alleged and definitely large claims under the Act would result in some more certain causes being found than had been elicited so far. It was only fair to the insured population to point out that the same thing was happening in other countries which had adopted the health insurance system. In Germany and, he understood, in Ireland, the same thing applied as in England and Wales. He hoped the Minister of Health would be able thoroughly to overhaul and reorganise if possible the whole scope of the national health insurance service in this country. He hoped that the Parliamentary Secretary would say that the Government contemplated before long being able to bring before the House a scheme to enlarge the whole of the service of national health insurance, coördinating the numerous branches of it, and bringing within its scope women and children and dependents, thereby crowning an Act which had been a very beneficent Act for the people of this country.

(To be continued.)

THE SLUM CLEARANCE BILL.

The Housing (No. 2) Bill was considered by Standing Committee A of the House of Commons on Thursday, May 1st. Mr. SCURR was in the chair.

Insanitary Areas.

On Clause 1 (which gives a local authority power to declare an unhealthy area to be a clearance area,

Dr. VERNON DAVIES moved an amendment to provide that the local authority should act under the clause after consideration of an official representation from a medical officer of health. He said this was a slum clearance Bill and its basic object was the protection of the health of the people who lived in slums. A medical man was necessary in judging conditions relating to health, and there was a particular branch of medicine in which medical officers of health had to take a special diploma. Therefore the man to determine whether the condition of any property was likely to be injurious to health should be the medical officer of health. As the clause now stood, information might come from people who were absolutely incompetent to furnish information, or might be acting from improper motives.

Mr. GREENWOOD (Minister of Health) said he could not accept the amendment under which there could be no clearance scheme without the consent of the medical officer of health.

Lieut.-Colonel FREMANTLE: Oh, no!

Mr. GREENWOOD said that that was what it meant. There might well be cases in which a local authority would be doing right in going forward with a clearance scheme without having obtained what was virtually the consent of the medical officer of health.

Lieut.-Colonel FREMANTLE said he saw the point put forward by the Minister, but he did not think the position was quite what the right hon. gentleman had stated. Of course a local authority had other means of obtaining information in addition to receiving representations from their medical officer of health, but if the clause remained as it was they could proceed without any consultation with the medical officer of health, or any report from him. The medical officer was the official who was technically trained for this purpose, and if in certain cases he was inclined to be dilatory, the local authority could call upon him for a report and they had power to secure other information.

Sir TUDOR WALTERS said that a medical officer of health was not in all cases the best person to discover insanitary areas. He (Sir Tudor Walters) was not a doctor, but he would be a better judge of an insanitary area than the most distinguished medical an in the country, because it happened to be his business to know something about the laying out of buildings and their construction.

Administrative Effects.

Mr. NEVILLE CHAMBERLAIN said he looked at this matter chiefly from the point of view of administration, and he viewed this innovation with some considerable concern. It was quite true that under the Bill it was open to a medical officer of health to make an official representation to the local authority, but if they did not accept that representation, housing reform would be held up quite as much as by a default on the part of the medical officer of health. He thought it was desirable that the local authorities should have all the information from whatever source it might come, but the responsibility should rest on the medical officer of health, and not on anybody else. If the medical officer of health knew that without any representation from him the local authority could act on information received from anybody, that must necessarily weaken his responsibility. He asked the Minister to give further consideration to the matter.

Miss SUSAN LAWRENCE (Parliamentary Secretary to the Ministry of Health) said the normal way would be for the medical officer of health to make representations in the exercise of his statutory duties, but a local authority might well have recourse to other information and act upon it. The only point at issue was whether in the case where an authority could not convert its medical officer to its view it should be placed in the dilemma of having to dismiss him or to drop the scheme. The plan outlined in the clause had

worked perfectly satisfactorily under the Act of 1925, and she thought that the provision had been reenacted from an earlier Act.

After further debate,

The amendment was rejected by 33 votes to 12.

Mr. HARRIS moved an amendment to make it clear that a clearance area might include buildings other than houses. He said he moved the amendment on behalf of the London County Council.

Mr. GREENWOOD accepted the amendment, which was agreed to.

"Bad Arrangement."

Mr. WOMERSLEY moved an amendment to leave out from Subsection (1) the words "their bad arrangement," and to insert instead the words "want of light, air, ventilation, or proper conveniences."

Mr. GREENWOOD said it would be a most retrograde step to cut out from their operations huddled groups of buildings and streets so narrow that they were really injurious to health.

Mr. WOMERSLEY: What does "bad arrangement" really mean?

Sir WILLIAM JOWITT, Attorney General, said that these words had found their place in housing statutes for the last sixty years, and as far as he knew there had never been any difficulty arising out of their vagueness.

Lieut.-Colonel FREMANTLE said he had been discussing with the Society of Medical Officers of Health the provisions of this Bill. The amendments which the Society desired were very few, but there was one which they put forward dealing with the difficulty in defining the provision as to "unfit for human habitation." Though it was true, as Sir William Jowitt had said, that the term "bad arrangement" had been in the law for a number of years, the difficulty none the less remained. What had a medical officer got to decide as being "unfit for human habitation" other than sanitary defects, want of air, and so forth, which were included in the later definition clause? This was one of the reasons probably for the allegation that there had been slackness in certain areas. He did not think this amendment would get over the difficulty, but there was a real point of substance in trying to define the term "bad arrangement."

The amendment was negatived.

An Obscure Clause.

Mr. CHAMBERLAIN moved an amendment to confine a clearance area to houses only. He said that he had put this amendment down largely to clear up the real meaning of the clause, which he found extremely obscure.

Mr. GREENWOOD said that if this amendment were adopted it would prove utterly impracticable. It was obvious that once they were satisfied that an area was injurious to the health of the people all the buildings should go. The confusion appeared to arise because it was thought that the area must be a solid piece, but that was not so. It might be dotted with islands which were excluded from the clearance area because the buildings on those islands did not conform to the conditions laid down in the clause. If the buildings did not in any way contribute by their bad arrangement, and so on, to the injury of the health of the people, then clearly they did not form part of the clearance area.

The amendment was still under discussion when the Committee adjourned.

HOUSE OF COMMONS.

WEDNESDAY, APRIL 30TH.

Sickness and Disablement Benefits.

Sir FREDERICK HALL asked the Minister of Health the numbers of insured men per 100 who claimed sickness benefit in 1921 and 1927, respectively; the respective amounts of expenditure in the same two years for sickness and disablement benefits and the State treatment of disease; the cost per head of the population of England and Wales in 1921 and 1927, respectively, for national health insurance; the cost per head of that population for the same years for State medical treatment; whether the tendency was for expenditure on sickness benefit to decrease as expenditure on preventive and curative treatment increased; and if he would consider setting up a suitable body to inquire into the working of the Health Insurance Acts.—Miss LAWRENCE, Parliamentary Secretary to the Ministry of Health, replied: The information desired by the hon. Member is as follows: (1) According to a report recently furnished by the Government Actuary of the sickness and disablement benefit experience of a representative sample of the whole body of insured persons, the number of insured men per 100 who claimed sickness benefit in 1921 and 1927 was 14 and 23 respectively. (2) The amounts expended under the Health Insurance Acts in England and Wales in 1921 and 1927 in respect of (*a*) sickness benefit, were £7,176,800 and £11,818,000 respectively; (*b*) disablement benefit, were £2,689,600 and £6,368,000 respectively; (*c*) Medical benefit, were £9,394,800 and £8,772,500 respectively. In this connexion it is pointed out that the increase in the amounts expended on sickness and disablement benefits in 1927 as compared with the corresponding amounts expended in 1921 was to some extent due to the fact that in the later of those years there were larger increases in the benefit rates under the societies' schemes of additional benefits. (3) The cost per head of the population of England and Wales in 1921 and 1927 for National Health Insurance was 13*s.* 11*d.* and 18*s.* 8*d.*, respectively, and of medical benefit provided under the Health Insurance Acts 4*s.* 11½*d.* and 4*s.* 5½*d.* respectively. As regards the last two parts of the question I would refer to the reply given on the 10th inst. The factors which have contributed to the increases above noted are numerous and complex, and without further and fuller consideration my right hon. friend does not think it possible to make any general statement as to the relation between those facts and the increased provision of curative and preventive treatment to which the hon. Member refers.

Importation of Unsound Meat.

Mr. THORNE asked the Minister of Health if he was aware that 541 carcasses of mutton from the Patea district of New Zealand were recently examined at a Wapping cold store for caseous lymphadenitis and 27 carcasses condemned; that 40 bags of legs of mutton were recently examined at the Port of London refrigerator, Charterhouse-street, and out of 400 legs 31 were found to be badly affected with the disease and condemned; and that the 27 sheep from Patea, New Zealand, had each attached to the leg a certificate of a veterinary inspector of the New Zealand Government to the effect that they had been examined and found sound; and if he would approach the High Commissioner of New Zealand and issue instructions that in future a thorough examination must be made of all legs and shoulders imported in bags at all centres where such bags are landed.—Miss LAWRENCE replied: My right hon. friend has made inquiries and is informed that the facts are substantially as stated in the question. He is bringing the matter to the notice of the Governments of the exporting countries. It is recognised by the local authorities concerned that several parts of carcasses require special attention, and on the information before him my right hon. friend does not think it is necessary to take the course suggested in the last part of the question.

THURSDAY, MAY 1ST.

Food Tickets as Unemployment Relief.

Sir GEORGE PENNY asked the Minister of Labour whether, instead of paying the full amount of unemployment benefit in cash, she would consider the desirability of issuing food tickets for a proportion of the amount where the recipient had a family dependent upon him.—Miss BONDFIELD replied: This suggestion has been considered several times in the past. In my view, it would not be desirable to adopt it.

Coroners' Salaries.

Mr. TINKER asked the Home Secretary the salaries paid to the coroners for St. Helens and Leigh; and what other parts of the county they had charge of in addition to the above.—Mr. CLYNES replied: St. Helens is in the West Derby Coroner's District which includes the Petty Sessional Divisions of Kirkdale, Ormskirk, St. Helens, Southport, and Warrington, parts of the Petty Sessional Divisions of Leigh, Prescot, and Wigan, and the whole of the County Boroughs of Bootle, St. Helens, Southport, and Warrington. The salary, I understand, is £1145. Leigh is in the Bury District, which includes the Petty Sessional Division of Bolton and parts of the Petty Sessional Divisions of Bury, Leigh, and Wigan, and the whole of the Borough of Leigh and of the county borough of Bury. I understand that the salary is £625.

Milk for School-children.

Mr. HURD asked the President of the Board of Education what educational authorities were participating in the campaign to increase the consumption of milk by school-children; and what extension of the campaign was in contemplation.—Sir CHARLES TREVELYAN replied: I understand from the National Milk Publicity Council that their Milk Service scheme in the schools is in operation in 82 areas, with the general approval and encouragement of the local education authorities concerned. A number of other authorities are providing milk meals under their arrangements for the

provision of meals. I am anxious to see an increase in the consumption of milk in the schools, and with this end in view I am keeping in close touch with the National Milk Publicity Council.

"Drink More Milk" Campaign.

Mr. HURD asked the Minister of Agriculture what steps were being taken to renew and extend the drink more milk campaign; and what evidences were available of the increased consumption of liquid milk as a result of such propaganda.—Dr. ADDISON (Parliamentary Secretary to the Ministry of Agriculture) replied: There is no special milk advertising campaign in progress in this country at the present time, but the National Milk Publicity Council is continuing its work in the formation of milk clubs in the elementary and secondary schools of this country, which it is estimated has increased the consumption of milk by about 4,000,000 gallons a year.

Disposal of London Refuse.

Lieut.-Colonel FREMANTLE asked the Minister of Health how soon the report of the Departmental Committee on the Disposal of London Refuse was to be published.—Mr. GREENWOOD replied: I am informed that the Report is likely to be signed in the course of the present month.

Smoke Abatement.

Lieut.-Colonel FREMANTLE asked the Minister of Health how many local authorities had made by-laws under Section 5 of the Public Health (Smoke Abatement)Act, 1926; whether model by-laws under this section had been issued from the Ministry of Health for the guidance of local authorities; and, if not, what was the reason.—Mr. GREENWOOD replied: No local authority has made by-laws or forwarded draft by-laws under this section. Model by-laws have not yet been issued, by reason of technical difficulties.

Psittacosis.

Mr. HACKING asked the Minister of Health how many cases of parrot disease had been reported to him during each of the past two months.—Mr. GREENWOOD replied: My department has received information of 24 cases of illness which commenced during March, and two during April, in which the patients had been associated with sick parrots. I am advised, however, that in the present state of knowledge of psittacosis, it is not possible to say definitely how many of these persons were in fact suffering from that disease.

MONDAY, MAY 5TH.

Medical Qualifications in India.

Mr. FREEMAN asked the Secretary of State for India whether the Government of India had received any proposals for the constitution of an inter-university medical board, consisting of representatives of the Government and of the university, pending the establishment of an All-India General Medical Council; and, if so, whether they proposed to take any steps in the matter.—Mr. WEDGWOOD BENN replied: This proposal was made by a Conference of Indian Universities last October. It was referred to the General Medical Council, whose executive Committee adopted on Feb. 24th a resolution stating that it was unable to accept the proposal as furnishing a satisfactory method of supplying the Council with authoritative information on medical qualifications and standards in India, and with the necessary guarantees of sufficiency.

Mr. FREEMAN also asked whether it was proposed to revive the competitive examinations for admission to the Indian Medical Service; and, if so, whether he would consider the desirability of ordering these examinations to be held in India only.—Mr. WEDGWOOD BENN replied: I am sending my hon. friend a copy of the report of a debate on this subject in the Indian Legislative Assembly on Jan. 28th last, in which the present position is explained. It will be seen that the Government of India propose to review the situation and send me their considered views, which I am expecting shortly.

Development Fund Grant.

Mr. RAMSBOTHAM asked the Secretary to the Treasury the exact use of the grant of £500,000 made by his department to the development fund.—Mr. PETHICK-LAWRENCE (Financial Secretary to the Treasury) replied: The grant of £500,000 to the Development Fund will be issued in instalments as and when required. The advances (grants and loans) already recommended by the Development Commissioners and approved by the Treasury, includes £65,000 (in addition to £35,000 sanctioned previously) for the rebuilding of the Royal Veterinary College, and £4250 for the extension of the laboratory at the Cambridge Department of Animal Pathology.

TUESDAY, MAY 7TH.

Nurses' Conditions at Larbert Asylum.

Miss LEE asked the Secretary of State for Scotland what steps he intended to take to improve the wages and working conditions of nurses in Larbert Asylum.—Mr. ADAMSON replied: The General Board of Control are at present making inquiries into the conditions of service generally in Scottish asylums and the Larbert Asylum will be included within the scope of the inquiries.

Health of the Mercantile Marine.

Sir BASIL PETO asked the President of the Board of Trade the names of those serving on the committee set up to consider and advise on the health of the mercantile marine; and whether their report on the hygiene of crew spaces on board ship might be expected shortly.—Mr. W. GRAHAM replied: The membership of the committee is as follows: Representing the Board of Trade—Mr. E. J. Foley (Chairman), Mr. G. E. Baker, Mr. A. S. Hoskin, and Mr. C. J. Ovey (Clerical Secretary); Representing the Ministry of Health—Sir George S. Buchanan, Dr. P. G. Stock, Mr. M. Heseltine, Mr. R. H. Crooke, and Dr. M. T. Morgan. (Medical Secretary). I cannot yet say when the committee will be in a position to report on the question of the improvement of the hygiene of crew spaces.

Surplus Funds of Approved Societies.

Mr. HAYDAY asked the Minister of Health (1) the total surplus funds standing to the credit of all approved societies under the Health Insurance Acts, at the nearest convenient date; and (2) the total amount set aside by approved societies for the last insurance year for additional benefits; and the nature of such additional benefits and the amounts, respectively, allocated.—Mr. GREENWOOD replied: The total of the surplus funds of approved societies and branches under the Health Insurance Acts is ascertained by quinquennial valuations. The results of the last completed valuations are summarised in the report of the Government Actuary dated Nov. 25th, 1926 (Cmd. 2785). The hon. Member will see from that report that the total surpluses amounted to £42,413,319, from which amounts totalling £26,619,161 were certified for distribution in additional benefits in the ensuing quinquennium. Out of the above distributable surplus, £13,345,000, or about onehalf, was applied by the societies and branches concerned in providing increases of the statutory cash benefits, and the remainder was utilised for the provision of various treatment benefits. The most important of these benefits and the annual sums made available for them during the period of the schemes (including State grant) were as follows: Dental benefit, £2,900,000; ophthalmic benefit, £470,000; hospitals, £324,000; convalescent home treatment, £233,000; and medical and surgical appliances, £142,000. As regards the total reserve funds of approved societies, I would refer to the reply given on March 6th last.

National Health Insurance.

Mr. HAYDAY asked the Minister of Health the number of insured persons removed from health insurance on attaining the age of 65 years, and how many of these were transferred from sickness benefit to old age contributory pension for the year ending January, 1930.—Mr. GREENWOOD replied: The number of insured persons who, up to Dec. 31st, 1929, had ceased to be entitled to sickness and disablement benefits under the National Health Insurance Acts by reason of the reduction of the age limit from 70 to 65, is estimated to have been about 650,000. These persons have not been "removed from National Health Insurance," since they continue to be entitled to medical benefit, and to any additional benefits in the nature of treatment after attaining the age of 65. I regret that the information asked for in the second part of the question is not available.

First-Aid in Coal Mines.

Mr. THOMAS WILLIAMS asked the Secretary for Mines whether the new regulations regarding first-aid at coal mines were compulsory, and, if so, if he had received any complaints concerning collieries who had failed to carry them out.—Mr. BEN TURNER replied: The answer to the first part of the question is in the affirmative, and to the second part in the negative. These regulations, which only came into operation a month ago, involve big changes, amounting at some collieries to a complete reorganisation of first-aid work. In some instances it has not yet been possible for this reorganisation to be carried out in the full detail required by the regulations, but the matter is receiving the special attention of H.M. inspectors, who will see that there is no unnecessary delay.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Lt. J. V. Williams to be Surg.-Lt. Comdr.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. to be Col.: Bt.-Col. (temp. Col.) J. S. Bostock from R.A.M.C.

Lt.-Col. D. S. Skelton to be temp. Col.

Maj. and temp. Lt.-Col. A. S. Littlejohns to be Lt.-Col., vice Lt.-Col. and Bt.-Col. (temp. Col.) J. S. Bostock.

Maj. C. R. M. Morris to be temp. Lt.-Col.

Maj. C. S. P. Hamilton retires, receiving a gratuity.

Capt. E. H. W. Elkington to be Maj.

Capts. to be Majs.: J. D'A. Champney and V. J. Perez.

ARMY DENTAL CORPS.

Lts., temp. Dental Surgs., Gen. List, to be Lts. (on prob.): W. C. Cook and S. G. Watson.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Maj. P. R. Bolus having attained the age limit, retires and retains his rank, with permission to wear the prescribed uniform.

ROYAL AIR FORCE.

Flying Officer J. L. Groom is promoted to the rank of Flight Lt.

INDIAN MEDICAL SERVICE.

Maj. R. de S. B. Herrick to be Lt.-Col.

Medical News.

UNIVERSITY OF OXFORD.—On May 1st the following degrees were conferred:—

D.M.—R. A. Walsh.

B.M.—R. G. Macbeth and M. G. Pearson.

UNIVERSITY OF CAMBRIDGE.—On May 3rd the following degrees were conferred:—

M.B., and B.Chir.—John Foster, T. D. W. Fryer, and C. J. M. Dawkins.

B.Chir.—*T. O. Garland

* By proxy.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the final examination from March 31st to April 24th the following candidates were approved in the subjects indicated, but are not eligible for the diplomas of the Colleges:—

Medicine.—N. B. Bapat, Bombay and Birmingham; S. W. T. Bentall, London; A. C. Bhardwaj, Lahore and Guy's; I. Billig, St. Thomas's; J. D. Bright-Richards, Liverpool; G. F. Carey, St. Thomas's; P. Chandra, Punjab and St. George's; L. Charney and D. N. Chatterji, London; A. H. Clegg, Leeds; Jane A. Davies, Cardiff and Royal Free; V. S. H. Davies, Liverpool; C. A. V. De Candole, St. George's; C. H. Devin, St. Bart.'s; D. Divine, Guy's; D. Durbach, St. Bart.'s; D. G. Evans, Cardiff and Univ. Coll.; E. D. FitzPatrick, Birmingham; P. L. Franks, St. Bart.'s; L. P. Friedman, Univ. Coll.; W. G. Glassco, McGill and St. Mary's; L. H. Griffiths, Bristol; Florence R. Hart, King's Coll.; Carrie I. Hearn, Pennsylvania and Royal Free; H. R. Hovsha, King's Coll.; J. C. de V. Hutchinson, Cape and Guy's; E. B. Jackson, Univ. Coll.; E. J. Javeri, London; C. R. Kenchington, Birmingham; F. S. Krusin, Guy's; S. R. Ledger, King's Coll.; R. F. Lomax, Guy's; S. H. Lubner, London; Marjorie N. Lunn, Royal Free; F. G. Maitland, St. Thomas's; A. F. Merchant, Bombay; D. K. Mulvany, King's Coll.; P. B. Nair, Bombay and Royal Free; Ethelwyn M. Newham, Royal Free; P. W. Parkes, Birmingham; M. A. Parthasarathy, Bombay and Guy's; R. V. C. Richards, Cardiff and Bristol; L. Rose, St. George's; A. L. Rowson, Manchester and London; K. C. Sarkar, King's Coll.; Ida B. Saxby, Bristol; Ester C. Seifert, Westminster; M. Shorvon, King's Coll.; A. Shufleder and M. I. Silverton, Leeds; C. H. Sims, Westminster; D. J. R. Steen, St. Thomas's; H. B. Swift, St. Mary's; C. J. L. Thurgar, Univ. Coll.; O. T. Wade, Leeds; E. C. Watson, St. Mary's; Celia Weinstein, Royal Free; and Margaret E. Williams, Bristol.

Surgery.—F. P. Adams, St. Bart.'s; G. L. Alcock, St. Thomas's; N. W. Alexander, Cambridge and St. Thomas's; W. T. Andrews, St. Thomas's; R. E. Angel, St. Bart.'s; Lily Arratoon, Royal Free; J. Aytoun, Middlesex; F. G. Badger, Cardiff and London; Inez E. Banner, Royal Free; J. H. Beilby, Cambridge and St. Thomas's; Ilma B. S. Bingemann, St. Mary's; A. T. Blair, St. Bart.'s; B. F. M. Bond, Westminster; O. H. Bostock, St. George's; F. K. Boston and W. R. Burrows, St. Bart.'s; G. W. Causey and J. W. Cheetham, Liverpool; H. T. Chilton, Birmingham; C. N. Chitnis, Bombay and St. George's; R. T. V. Clarke, St. Bart.'s; E. C. Coaker, St. Mary's; D. H. Collins, Liverpool; W. D. Coltart, St. Bart.'s; A. C. Dawes Birmingham; J. A. Doherty, Univ. Coll.; W. S. Dyson Manchester; A. Elliott, Birmingham; D. G. Evans Univ. Coll.; A. A. G. Flemming, Bristol; E. V. P. Fox St. Bart.'s; P. P. Fox, Liverpool; C. E. D. H. Goodhart, St. Bart.'s; Lorna M. A. Goulden Bach, Westminster; Olive N. Grant, Royal Free; F. R. T. Hancock, St. Bart.'s; H. E. Harding, London; J. O. Harrison, St. Bart.'s; G. Hale, St. Thomas's; A. R. C. Higham, St. George's; Constance M. Hoare, King's Coll.; Beatrice M. Joly, Royal Free; I. G. Jones, Univ. Coll.; M. S. Khan, Cambridge and Middlesex; F. R. Kitchin, Liverpool; G. C. Knight, St. Bart.'s; F. S. Krusin, Guy's; J. C. Leedham-Green, Middlesex; Henrietta M. Macleod and Moyra I. Macnaughton-Jones, Royal Free; J. W. Meanley, Leeds; C. G. Muller, Madras and St. Mary's; K. I. Nicholls, Bristol; T. C. Outred, Guy's; D. L. Pugh, Univ. Coll.; V. H. Riddell, St. George's; N. H. L. Ridley, St. Thomas's; D. M. Roberts, Cardiff and London; M. W. Robinson, Manchester; A. W. M. Rooke, Univ. Coll.; M. H. Salaman, Cambridge and London; F. M. Sandford, St. Thomas's; Margaret W. Schreiber and Dorothy A. Sharpe, Royal Free; H. J. Shorvon, St. Thomas's; C. J. C. Siggers, Guy's; C. H. Sims, Cardiff and Westminster; M. Singh, Birmingham; W. L. Sleight, Bristol; A. A. Staunton, St. Bart.'s; J. G. Stewart, Westminster; H. M. Strover, Bristol; C. E. Taylor, King's Coll.; R. S. Taylor, Middlesex; J. W. P. Thompson and A. W. Vaisey, St. Thomas's; M. G. Vatsalya, Bombay and Royal Free; J. G. Warren, London; A. B. Williamson, Durham; Maureen D. Willmott-Evans, Royal Free; and F. W. Willway, King's Coll.

Midwifery.—R. Ahmad and S. G. Allen, London; G. H. H. Ames, Univ. Coll.; A. T. Andreasen and R. E. Angel, St. Bart.'s; J. Aytoun, Middlesex; E. H. S. Bebb, London; W. R. Bion, Univ. Coll.; Marjorie F. Birch, Liverpool; J. F. E. Bloss, St. Thomas's; Kathleen M. Bodkin, Birmingham; K. Bown, Univ. Coll.; Dora E. Brockbank, Royal Free; K. C. Buck, St. Mary's; A. H. Bulleid, London; W. R. Burrows, St. Bart.'s; Beatrice L. Campion, Royal Free; G. W. Causey and W. N. Chalmers, Liverpool; J. Chamberlain, Guy's; L. P. B. Chamberlain, St. Bart.'s; T. Chandrasekharan, Madras and Manchester; J. W. Cheetham, Liverpool; F. A. Clift, Toronto and London; Adelina A. Collins, King's Coll.; D. H. Collins, Liverpool; R. V. S. Cooper, Birmingham; A. G. Cowie, St. Mary's; L. C. Crane, Manchester; I. Culank, Middlesex; H. E. B. Curjel, St. Thomas's; M. K. Cusack, St. Bart.'s; V. S. H. Davies, Liverpool; A. C. Dawes, Birmingham; P. T. L. Day, Guy's; G. A. Desai, London; S. B. Dimson, Univ. Coll.; R. H. Dobbs, Cambridge and London; G. W. Duncan, Univ. Coll.; Joanna M. Egerton, King's Coll.; A. Elliott, Birmingham; S. H. Ferguson, Sheffield; B. Fine, London; E. D. FitzPatrick, Birmingham; J. S. B. Forde, Manchester; P. P. Fox, Liverpool; K. H. Gaskell, King's Coll.; Rachel N. Gillespie, Royal Free; S. E. Godwin, St. Bart.'s; C. E. D. H. Goodhart, Cambridge and St. Bart.'s; Olive N. Grant, Royal Free; J. B. Great Rex, St. Bart.'s; Rachel Gubbay, Royal Free; J. H. Hall, Cambridge and St. Thomas's; W. H. Hargreaves, St. Bart.'s; Joan E. Harwood, Charing Cross; M. A. Hatt, St. Thomas's; F. Hilmy, Durham; W. Hogg, St. Bart.'s; G. R. Hopper, Liverpool; Doris I. Howell, Charing Cross and Cardiff; A. Ingham, Birmingham; E. Jones, St. Thomas's; C. R. Kenchington, Birmingham; F. R. Kitchin, Liverpool; B. W. Knight, St. Bart.'s; Madeline E. E. Knowlson, Westminster; N. I. Kronenberg, Guy's; J. S. Lane, Cambridge and Guy's; B. Lawn, St. Thomas's; J. C. Leedham-Green, Middlesex; H. M. List, St. Bart.'s; H. O. Lyne, Guy's; P. H. Maal, Liverpool; J. MacDonald, Glasgow; J. E. S. MacDonald, London; W. F. McGladdery, St. Bart.'s; F. G. Maitland, St. Mary's; Dorothy Makepeace, King's Coll.; S. F. Marshall, St. Bart.'s; H. Marsten, Charing Cross; E. K. Menon, Madras and Birmingham; Barbara A. Merlin, Royal Free; Caroline E. Nicholson, Charing Cross; T. F. B. Noble, London; Angela M. S. A. Ofenheim and Lily M. O'Hanlon, King's Coll.; G. Y. Oon, Charing Cross; M. A. Parthasarathy, Bombay and Guy's; F. L. L. Patrick, St. Bart.'s; C. Pratelli, Middlesex; L. B. Reeves, King's Coll.; Anna L. M. Ringdahl, Univ. Coll.; D. R. R. Roberts, St. Mary's; M. A. Robertson, Cambridge and London; J. T. Rowe, St. Bart.'s; Agnes A. S. Russell, Glasgow; S. Ryman, Zurich; M. H. Salaman, Cambridge and London; A. G. Sanders, St. Thomas's; K. C. Sarkar, King's Coll.; M. N. Sardana, Punjab; Margaret W. Schreiber, Royal Free; J. B. Schofield, Guy's; Ester C. Seifert, Westminster; A. Shafi, Charing Cross; Dorothy A. Sharpe, Royal Free; I. Sherman, St. Bart.'s; H. Shoukry, Birmingham; C. J. C. Siggers, Guy's; H. Simmons, St. Bart.'s; C. K. Simpson, Guy's; D. O. C. Simpson, London; K. C. S. Skene, Univ. Coll.; S. K. Squires, St. Mary's; T. Standring, King's Coll.; A. A. Staunton, St. Bart.'s; N. V. Storr, St. Thomas's; R. B. Sutcliffe, Guy's; H. B. Swift, St. Mary's; G. Tattersall, Manchester; C. E. Taylor, King's Coll.; D. Trimble, Birmingham; C. K. Vartan, St. Bart.'s; N. A. Vernon, St. Thomas's; R. S. Wale, King's Coll.; S. I. Weinstein, London; J. C. S. Wells, Univ. Coll.; A. M. Weston, Guy's; W. E. Whaite, Manchester; R. C. W. Whitling, Oxford and London; S. O. Widmann, St. Thomas's; K. L. Wig, Charing Cross; R. N. H. Williams, Cambridge and St. Bart.'s; H. W. Williamson, St. Bart.'s; W. H. Willis, Western Reserve Univ.; F. W. Willway, King's Coll.; D. Wilson, St. Mary's; Edna M. Wilson,

Charing Cross; W. E. Wimberger, Birmingham; W. G. Wright, King's Coll.; and Erika R. Wulfahrt, Royal Free.

Pathology.—A. T. Andreasen, St. Bart.'s; W. Aukin, Univ. Coll.; C. O. Barnes, St. Bart.'s; C. R. G. Barrington, Univ. Coll.; G. Barwell, K. Biden-Steele, and W. V. D. Bolt, Guy's; G. D. S. Briggs, St. Bart.'s; L. V. O. Brown, Guy's; K. C. Buck and H. Canwarden, St. Mary's; A. R. Clarke, Guy's; G. M. Conder, Middlesex; A. C. Crooke, London; M. K. Cusack, St. Bart.'s; F. M. Day, St. Mary's; D. M. Dean, St. Bart.'s; L. E. A. Dearberg, Guy's; C. H. Devin, St. Bart.'s; J. W. H. Foy, Liverpool; L. P. Friedman, Univ. Coll.; P. W. Godfrey, Leeds; E. R. Greathead, London; J. B. Great Rex, St. Bart.'s; K. Harris, Guy's; Eileen E. Harvey, Royal Free; D. W. James, Guy's; B. W. Knight and J. S. Knox, St. Bart.'s; S. Lefcovitch and G. A. M. Lintott, Guy's; G. D. McLean, St. Thomas's; R. W. McNabb, Guy's; J. B. Marshall, St. Mary's; S. F. Marshall, St. Bart.'s; J. W. Oliver, Guy's; G. H. Pearce, Univ. Coll.; S. Rajapaksa, King's Coll.; A. W. M. Rooke, Univ. Coll.; M. Shorvon, King's Coll.; H. Silverberg, Middlesex; C. H. Sims, Westminster; K. C. S. Skene, Univ. Coll.; R. N. C. Smith and K. S. Southam, Guy's; S. K. Squires, St. Mary's; J. T. C. Taylor, St. Bart.'s; C. J. L. Thurgar, Univ. Coll.; R. S. Wale, King's Coll.; J. C. S. Wells, Univ. Coll.; Mary J. Westall, Royal Free; R. Wilkinson, Birmingham; Anne E. Williams-James, Bristol; and D. Wilson, St. Mary's.

EUGENICS EDUCATION SOCIETY.—Mr. Henry Twitchen, of Portland-place, London, and formerly of Western Australia, after other bequests has left his residual estate, estimated at about £100,000, to the Eugenics Education Society, of Upper Bedford-place, London.

CHADWICK PUBLIC LECTURES.—At the Royal Sanitary Institute, 90, Buckingham Palace-road, London, S.W., at 8 P.M., on Thursday, May 15th, Mr. Edward Willis will lecture on The Collection and Disposal of Refuse.—Sir William Collins will preside at a lecture entitled Cabbages and Kings, to be given by Mr. A. W. Hill, F.R.S., director of Kew Gardens, in the Chelsea Physic Garden, Swan Walk, Chelsea, at 5 P.M., on Thursday, May 29th.

GLASGOW UNIVERSITY CLUB, LONDON.—The annual summer dinner of this club will be held at the Trocadero Restaurant, Piccadilly, on Friday, May 30th, at 7.30 P.M., with Mr. Robert S. Rait, LL.D., Principal and Vice-Chancellor, presiding. Any Glasgow University men who, though not members of the club, desire to attend, are asked to communicate with the hon. secretaries at 62, Harley House, N.W.1.

SEROLOGICAL DIAGNOSIS OF CANCER.—As we have already announced, the Italian Anti-Cancer League (Lega Italiana per la lotta contro il cancro, via Triboniano, Piazza Cavour, Rome) offers a prize of 15,000 lire for a paper written from a critical and experimental standpoint, on the value of serological methods in the diagnosis of malignant tumours. The paper must be submitted in proper form before June 30th.

MEDICAL PRAYER UNION.—The annual medical missionary breakfast will be held at 8 A.M. on Wednesday, May 21st, at the Refectory, University College, Gower-street, London, W.C. An address will be given by Mr. John Kirk, F.R.C.S., of University College, London, late of Kwangtung, China. Those intending to be present should inform the hon. secretary, Dr. Tom Jays, Livingstone College, Leyton, E.10.

ROYAL INSTITUTION.—At the annual meeting of the members of this institution on May 1st the following officers were elected for the ensuing year. President: The Duke of Northumberland. Treasurer: Sir Robert Robertson. Secretary: Major C. E. S. Phillips. Among the managers elected were Mr. Ernest Clarke, F.R.C.S., Sir James Crichton-Browne, M.D., and Mr. V. Warren Low, F.R.C.S.; while among the visitors were Prof. G. E. Gask, F.R.C.S., Mr. David Heron, F.R.C.S., Mr. G. W. C. Kaye, D.Sc., and Dr. H. R. D. Spitta.

CRITICISM OF PANEL PRACTITIONERS.—At the fifty-first annual conference of the Friendly Societies' Medical Alliance, held at Buxton on Easter Monday, a discussion arose on the following paragraph in the report of the council:—

> "We believe and confidently assert that our system of whole-time medical service is the most efficient and satisfactory that can be provided for workers and their dependents. It is certainly better adapted to the requirements of National Health Insurance and the Friendly Societies generally than the existing part-time service afforded by panel doctors who are mainly occupied and interested in private practice and fee-paying patients, to whom preferential treatment is usually afforded."

One of the delegates said that they were looking forward to a national medical institution where they would be able to feel assured that the health of the people was cared for by doctors who would come under State control. The paragraph quoted was eventually deleted from the report.

ESSEX COUNTY MENTAL HOSPITAL.—A new nurses' home, adjacent to this hospital, which has been built at a cost of £22,000, was opened last week. It accommodates 67 nurses and has a large recreation room.

MANCHESTER ROYAL INFIRMARY.—This hospital reports a large progressive increase in casualties. Last year there were 30,648, a daily average of 84; in 1920 it was only 50. In-patients (11,356) stayed an average of 17·67 days and cost £3 3*s.* 11*d.* per week each.—*Old Residents' Club*: The triennial dinner of this club will be held in Manchester on Saturday, Oct. 25th, 1930. Particulars will be circulated to members in due course.

TAVISTOCK-SQUARE CLINIC.—Nearly 300 people attended the annual meeting and luncheon of this clinic on May 5th, and Dr. H. B. Brackenbury, who presided, was able to report a growing interest in its work. A recognition of the psychotherapeutic needs of many insured persons would, he felt, do much to lessen the claims for sickness and disablement benefit now being received under the Insurance Acts. Dr. W. J. Adie said that while there were many excellent old-established hospitals for the treatment of organic nervous disease, facilities were at present inadequate for the treatment of functional disease. Again and again he had been forced to tell hospital patients that he was unable to provide them with the treatment they needed, and that he did not know where they would obtain it. The situation was now a little better because some of them could be sent to the Tavistock Clinic. He was able to recommend the institution with great confidence because he knew that psychotherapeutic treatment was not given indiscriminately, and that great care was exercised in assessing the importance of physical and psychical factors. If more was known about the upbringing of children and how to help young people through adolescence, much mental suffering would be prevented in later life. The Tavistock Clinic was already doing good work in this direction, and with the support it deserved it would do more. Miss Ishbel Macdonald emphasised the need for preventive work and was anxious for the establishment of more homes where patients could be sent during treatment at the clinic, so as to remove them temporarily from their usual environment. (A hostel has recently been opened, but on a very small scale.) Dr. H. Crichton-Miller, the honorary director, spoke of the growth of the clinic—a growth which was unfortunately not associated with growth of the building. The need for extension was very great, for the cases under treatment had increased from 700 two years ago to 914 this year. The number of attendances last year was 7472.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, May 13th.—5 P.M., THERAPEUTICS AND PHARMACOLOGY. Annual General Meeting. Election of Officers and Council. Informal Discussion: The Treatment of Disseminated Sclerosis. Opener: Sir James Purves-Stewart. 8.30 P.M., PSYCHIATRY. Annual General Meeting. Election of Officers and Council. Dr. Hubert J. Norman: Psychiatry in Relation to History and Biography.

WEDNESDAY.—5 P.M., SURGERY: SUB-SECTION OF PROCTOLOGY. (Cases and specimens at 4.30 P.M.) Annual General Meeting. Election of Officers and Council. Discussion: Radium in Cancer of the Rectum and Colon. To be opened by Sir Charles Gordon-Watson, who will show a film illustrating the treatment; followed by Dr. Lacassagne, Mr. Stanford Cade, Mr. Lockhart-Mummery, Mr. W. S. Perrin, and others. Mr. Lionel E. C. Norbury: Two Specimens of Rectal Carcinoma after Treatment with Radium. Other cases and specimens will be shown.

THURSDAY.—5 P.M., DERMATOLOGY. (Cases at 4 P.M.) Annual General Meeting. Election of Officers and Council. Cases: Dr. F. A. E. Silcock (introduced by Dr. G. B. Dowling). Papillaris Capillitii. Case for Diagnosis. Dr. R. T. Brain (for Dr. O'Donovan): Poikilodermia of Cavatte with Unusual Distribution. Ectodermal Defect, Tylosis and Dystrophy of Nails. Dr. G. B. Dowling: Case of Acne Agminata, Treated with a Gold Compound.

FRIDAY.—8 P.M., OBSTETRICS AND GYNÆCOLOGY. Annual General Meeting. Election of Officers and Council. Dr. Francis J. Hector: A Case of Endometrioma. Dr. G. W. Theobald: The Toxæmias of Pregnancy; a New Conception. Mr. A. J. Wrigley: Puerperal Infection by the Pathogenic Anaerobic Bacteria. 7 P.M., ELECTRO-THERAPEUTICS (at the Langham Hotel, Portland-place, W.). Annual General Meeting and Dinner. Election of Officers and Council.

SOCIETY OF RADIOGRAPHERS, 32, Welbeck-street, W.

WEDNESDAY, May 14th.—7 P.M., Mr. C. H. Holbeach, A.M.I.E.E.: Planning of an X Ray Department.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, May 12th.—8 P.M., Annual General Meeting. 8.45 P.M., Dr. Herbert Spencer will give a short account of 54 autograph Lettsom letters presented to the Society.—9 P.M., Sir Arthur Keith: Modern Medicine and Evolution. Annual Oration, which will be followed by a Conversazione.

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck-street, W.
THURSDAY, May 15th.—8.30 P.M., Dr. P. J. Kerley: The Pathology of Early Pulmonary Tuberculosis as Revealed by X Rays.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.
THURSDAY, May 15th.—8.15 P.M., preceded by a Demonstration at 7.45 P.M. Dr. H. M. Shelley: Pellagra in Nyasaland.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.
FRIDAY, May 16th.—4 P.M. (annual provincial meeting at Harrogate): Discussion on Rheumatism in its Public Health Aspects.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, May 12th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Wards.
TUESDAY.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Mr. Hamblen Thomas: Throat, Nose, and Ear Dept. 2.30 P.M., Sir Henry Simson: Gynæcological Operations.
WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2.30 P.M., Mr. Donald Armour: Surgical Wards. Dr. Scott Pinchin: Medical Out-patients.
THURSDAY.—11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. Bishop Harman: Eye Department. 2 P.M., Mr. MacDonald: Genito-Urinary Department.
FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Department. 2 P.M., Mr. Sinclair: Operations.
SATURDAY.—9 A.M., Mr. Vlasto: Throat, Nose, and Ear Operations. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Children's Department.
Daily, 10 A.M. to 5 P.M., Medical, Surgical, and Special Out-patients, Operations, Ward Visits, Anæsthetic Courses.

UNIVERSITY COLLEGE, Gower-street, W.C.
TUESDAY, May 13th.—5.30, P.M., Prof. W. E. Blatz: Modern Theories in Habit Training in the Pre-school Child.
WEDNESDAY and THURSDAY.—5.30 P.M., Prof. F. J. Cole: The Early History of Generation and Comparative Anatomy. (Third and Fourth of six free lectures.)

LONDON SCHOOL OF MEDICINE FOR WOMEN, Hunter-street, W.C.
MONDAY, May 12th, and following TUESDAY and THURSDAY.—5.30 P.M., Dr. A. Lacassagne: Treatment of Uterine Cancer by Radiations. (Free lectures.)

ST. MARY'S HOSPITAL INSTITUTE OF PATHOLOGY, W.
THURSDAY, May 15th.—5 P.M., Dr. Leonard Hill: The Physiology of Diving.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.
TUESDAY, May 13th, and following THURSDAY and FRIDAY.—5.30 P.M., Prof. A. J. Kluyver: Activities of Micro-organisms.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, May 12th, to SATURDAY, May 17th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. M.R.C.P. Special Course. Lectures every Tues. and Frid. at 8.30 P.M.—Tues., Dr. J. W. McNee: Recent Views on Diseases of the Liver and Biliary Tract. Frid., Dr. J. W. McNee: The Structure and Functions of the Spleen in Relation to its Diseases.—BOLINGBROKE HOSPITAL, Wandsworth Common, S.W. Mond., 10 A.M., Dr. Stanley Wyard: Demonstration in O.P. Department. No fee.—LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W. Thurs., 2 P.M., Mr. Herbert Paterson: Demonstrations in Wards and Operations. No fee.—CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C. Intensive course (clinical) in diseases of the throat, nose, and ear, lasting until May 24th.—MAUDSLEY HOSPITAL, Denmark Hill, S.E. Course in Psychological Medicine. Clinical Practice of Hospital. Special Lectures and Demonstrations.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Afternoon and Evening Course of Instruction in O.P. Department. Lectures on certain afternoons during the week.—CITY OF LONDON HOSPITAL FOR DISEASES OF THE HEART AND LUNGS, Victoria Park, E. All day course, lasting two weeks. Further particulars from the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, May 12th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose, and Throat Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Throat, and Ear Clinics. Operations.
FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M., Medical, Surgical, and Children's Diseases Clinics. Operations.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.
TUESDAY, May 13th.—5 P.M., Mr. W. McKim McCullagh: The Treatment of Post-partum Hæmorrhage.

LONDON SCHOOL OF DERMATOLOGY, SUMMER COURSE, St. John's Hospital, Leicester-square, W.C.
MONDAY, May 12th.—5 P.M., Dr. H. MacCormac: Treatment of Syphilis.
TUESDAY.—5 P.M., Dr. A. M. H. Gray: The Sarcoids and Lupus Pernio.
THURSDAY.—5 P.M., Dr. I. Muende: Pathological Demonstration.
FRIDAY.—5 P.M., Dr. Knowsley Sibley: Alopecia.

GREAT NORTHERN HOSPITALS POST-GRADUATE LECTURES.
WEDNESDAY, May 14th.—3.15 P.M. (at the Royal Chest Hospital, City-road), Dr. Barty King: Demonstration of Cases in the Wards.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.
TUESDAY, May 13th.—4.15 P.M., Dr. C. H. Melland: Gastric Ulcer.
FRIDAY.—4.15 P.M., Dr. D. E. Core: Demonstration of Medical Cases.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, May 14th.—4.15 P.M. (at the Royal Infirmary), Dr. J. C. Middleton: Medical Cases.

Vacancies.

For further information refer to the advertisement columns.

Bath, Royal United Hospital. H.P. £120.
Bedford County Hospital.—H.S. At rate of £175.
Birmingham General Hospital.—H.S. £70.
Birmingham, Queen's Hospital.—Res. Anæsthetist and Cas. H.S. Each at rate of £70
Birmingham, St. Chad's Hospital.—Res. M.O. £100.
Birmingham, Selly Oak Hospital.—Cas. O. At rate of £200.
Bolton Infirmary and Dispensary.—Res. Surg. O. £250.
Brighton, New Sussex Hospital for Women and Children.—H.S. and H.P. Each £50.
Brighton, Royal Alexandra Hospital for Sick Children.—H.P. £100.
Bristol Royal Hospital for Sick Children and Women.—Out-patient Phys. Also In-patient Surg. and Out-patient Surg.
Bristol Royal Infirmary.—Hon. Reg. for Ophthalmic Dept.
Bury St. Edmunds, West Suffolk General Hospital.—Jun. Res. M.O. £120.
Cambridge, Addenbrooke's Hospital.—Res. Anæsthetist. Also H.P. At rate of £180 and £130 respectively.
Cambridge University.—Fearnsides Scholarship for Clinical Research.
Cardiff Royal Infirmary.—H.S. At rate of £50. Aural H.S. and Cas. Surg. O. Each at rate of £75.
Charlton Relief District.—District M.O. £200.
Children's Hospital, College-crescent, Hampstead.—Res. M.O. At rate of £100.
Colchester, Royal Eastern Counties Institution for Mental Defectives.—Jun. Asst. M.O. £350.
Derbyshire Education Committee.—Asst. School M.O. £600.
Derbyshire Royal Infirmary.—Hon. Asst. S. Also Hon. Asst. S. to Ear, Throat, and Nose Dept.
Doncaster Royal Infirmary.—2nd H.S., 3rd H.S. Each £150. Also two Hon. Anæsthetists. £50.
Dorset County Hospital.—H.S. At rate of £120.
Dublin, Richmond Hospital.—Hon. Asst. Surg.
Durham County Hospital.—Sen. H.S. At rate of £160.
East London Hospital for Children and Dispensary for Women, Shadwell, E.—H.S. Also H.P. Each at rate of £125.
Elizabeth Garrett Anderson Hospital, Euston-road.—H.P., Obstet. Asst., Three H.S.'s. Each at rate of £50.
Evelina Hospital for Children, Southwark, S.E.—H.P. At rate of £120.
Glasgow Eye Infirmary.—Res. H.S. £150.
Gloucestershire Royal Infirmary and Eye Institution.—2nd H.S. At rate of £100.
Gt. Barrow, nr Chester, East Lancs., Tuberculosis Colony, Barrowmore Hall.—Asst. M.O. £250.
Great Yarmouth General Hospital.—H.S. £125.
Halifax Royal Infirmary.—3rd H.S. At rate of £100.
Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—Cas. M.O. and Cas. Surg. O. Each at rate of £100.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W Temporary Anæsthetist. At rate of £50.
Howe, Lady Chichester Hospital.—Jun. H.P. At rate of £50.
Hull Royal Infirmary.—H.S. At rate of £150.
Hyde, Borough of.—Asst. M.O.H. (Part-time). £300.
Inverness, Northern Infirmary.—H.P. £100.
Leeds Public Dispensary.—Jun. Res. M.O. £150.
Leicester Royal Infirmary.—3rd Res. Anæsthetist. At rate of £250.
Liverpool and District Hospital for Dis. of Heart.—H.P. At rate of £52.
London Female Lock Hospital, 283, Harrow-rd.—H.S. At rate of £150.
London Hospital, E.—Cardiographic Dept. Paterson Research Scholar. £400.
London Jewish Hospital, Stepney Green, E.—Res. M.O. Also Cas. O. Each at rate of £150. Jun. Res. M.O. At rate of £100.
London University, Chair of Physiology.—£1000.
Maidstone, Kent County Mental Hospital.—Asst. M.O. £300.
Manchester, Ancoats Hospital.—H.S. At rate of £100.

Manchester City.—M.O. for Maternity and Child Welfare Centres. £600.
Manchester Royal Infirmary.—H.P. and H.S. Each £200.
Manor House Hospital, Golders Green, N.W.—Jun. H.S. £200.
Mildmay Mission Hospital, Austin-street Bethnal Green, E.—Sen. Res. M.O. Also Jun. Res. M.O. At rate of £140 and £100 respectively.
Miller General Hospital, Greenwich-road, S.E.—Pathologist. £600. Out-patient Officer. At rate of £150. H.P. and H.S. Each at rate of £125.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Res. Anæsthetist. At rate of £100. Also Hon. Asst. Gyn.
Nottingham General Hospital.—2nd Cas O. At rate of £150.
Plymouth, South Devon and East Cornwall Hospital.—H.P. At rate of £120.
Portsmouth Royal Hospital.—H.P., 3rd H.S. Each at rate of £130. Also Cas. O. At rate of £100.
Reigate Borough of.—M.O. for Maternity and Child Welfare Centre. £150.
Rochester, St. Bartholomew's Hospital.—Res. Surg. O. At rate of £225.
Royal College of Surgeons of England.—Election of Professors and Lecturers. Also to Court of Examiners.
St. Bartholomew's Hospital, E.C.—Asst. Dental Surgeon. Also Physician.
Salford Royal Hospital.—H.P. Also Cas. H.S. Each at rate of £125.
Sheffield Royal Hospital.—Res. Ophth. H.S. Also Res. Anæsthetist. Each at rate of £80.
Sheffield Royal Infirmary.—Asst. Cas. O. At rate of £80.
South Eastern Hospital for Children, Sydenham, S.E.—Asst. and Res. M.O.'s. At rate of £100 and £75 respectively.
Southampton, Royal South Hants and Southampton Hospital.—Asst. H.S. At rate of £140.
Southern Rhodesia Medical Service.—Three Asst. and Relieving Government M.O.'s. £500.
Staffordshire Mental Hospital, Cheddleton, Leek.—Temp. Asst. M.O. One guinea per day.
Stoke-on-Trent, Longton Hospital.—H.S. £120.
Swansea General and Eye Hospital.—H.S., Cas. O., and H.S. Each at rate of £150. Also H.S. to Ear, Nose, Throat and Ophth. Dept. At rate of £200.
Walsall General Hospital.—Sen. H.S. At rate of £200.
Warwick, Warwickshire King Edward VII. Memorial Sanatorium, Hertford Hill.—Med. Supt. £800.
West London Hospital, Hammersmith, W.—Hon. Surg.
Weston-super-Mare General Hospital.—Res. H.S. £130.
Weymouth and District General Hospital.—H.S. £180.
Whipps Cross Hospital, Whipps Cross-road, Leytonstone, E.—Anæsthetist. £300.
Willesden General Hospital, N.W.—H.P. £100.
Wolverhampton Royal Hospital.—Cas. O. and Res. Anæsthetist. At rate of £125.
Woolwich and District War Memorial Hospital, Shooters Hill, S.E.—H.S. At rate of £125.
Worksop, Victoria Hospital.—H.S. At rate of £170.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Week St. Mary (Cornwall); Exmouth (Devon); and Southend (Essex).

Births, Marriages, and Deaths.

BIRTHS.

ARTHUR.—On May 2nd, at Noy's End, Brockham, Betchworth, Surrey, the wife of Dr. J. H. Arthur, of a son.
COCHRANE.—On May 1st, the wife of Dr. Robert G. Cochrane, Orpington, of a son.
GARRETT.—On April 27th, at Leicester, the wife of Dr. E. B. Garrett, of a daughter.
JONES.—On May 2nd, to Drs. Catherine and Ernest Jones, York-terrace, N.W.—a daughter.
JORY.—On May 2nd, the wife of Philip Jory, D.S.O., F.R.C.S., of a son.
MOORE.—On April 29th, at The Brow, Essa-road, Saltash, Cornwall, the wife of Surgeon-Commander N.S. Moore, R.N., of a son.
ROE.—On April 27th, the wife of Patrick Roe, M.B. Lond., of a son.

MARRIAGES.

BARFORD—HANDLEY.—On April 23rd, at St. Francis's Church, Crawley, Leslie Joseph Barford, M.A., M.D., to Isabella Helen, younger daughter of Mr. and Mrs. Robert B. Handley, of Mayfields, Lowfield Heath, Crawley.
WHYTE—WARD-PAGE.—On April 26th, at St. Michael's Church, Woburn Sands, Bucks, Alexandra Fraser Whyte, M.B., Ch.B., to Mona Ward-Page, only daughter of Mr. and Mrs. H. Ward-Page, Silver Birch, Apsley Heath, Beds.

DEATHS.

COUPLAND.—On April 29th, at Wootton Ridge, Boars Hill, Oxford, Sidney Coupland, M.D., F.R.C.P., aged 80 years.
CUTLER.—On May 3rd, at Onslow-gardens, S.W. after a short illness, Horace Arthur Cutler, M.D., B.Ch., aged 54.
GRIER.—On April 29th, Lieut.-Colonel Henry Grier, A.M., R.A.M.C. (retired), of Denton House, Guildford, aged 75.
HEARSEY.—On April 30th, suddenly, at Karell Estate, Bareilly, India, Lieut.-Colonel Herbert Hyde Young Hearsey, O.B.E., M.B., C.M., late P.M.O., of Nyasaland.
HEATH.—On April 30th, 1930, at 34, Devonshire-place, W.1, after a long illness, Agnes Fridzwede, wife of Charles J. Heath, F.R.C.S.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

Notes, Comments, and Abstracts.

SHOULD MEDICINE BE A MENDICANT?

A REVIEW OF OUR HOSPITAL SERVICE.

Harveian Lecture delivered at the Harveian Society of London on March 13th

BY ERNEST W. HEY GROVES, F.R.C.S. ENG.,
PROFESSOR OF SURGERY IN THE UNIVERSITY OF BRISTOL.

(*Continued from p. 998.*)

Three Types of Institution.

IN reviewing the present position of the hospital service of this country we distinguish three different types of institutions: the public health service with the municipal hospitals; the large voluntary hospitals, many of which have medical schools attached to them; and thirdly the smaller town, country or cottage hospitals, which serve the needs of a local area. For the sake of completeness one ought to add a fourth class—namely, the private hospitals and nursing homes—but for the moment I would leave them out of the consideration. All these groups of hospitals are suffering from such serious drawbacks and disabilities that we are justified in saying that the British hospital system is in need of reform and reorganisation.

I.—*The Municipal Hospitals.*

These are really a very modern product. They have been called into existence by the fact that the voluntary hospitals are incapable of dealing with the numbers of cases requiring treatment. Beginning as workhouse infirmaries they have rapidly grown into large general hospitals admitting acute cases. In the city districts the municipal hospitals, generally speaking, are good modern buildings, comparing very favourably in these respects with the voluntary hospitals of the same place. In the country districts the public hospitals are still inadequate both in size and structure, but this deficiency is likely to be remedied in the near future, because of the provisions of the recent Local Government Act. But taking the best type of city municipal hospital there is a glaring defect which quite spoils the institution, and makes it only a second or third-rate affair. This is the inadequacy of the staff. All such hospitals have a whole-time medical staff responsible for the administrative work. Some in addition have whole-time medical and surgical officers responsible for treatment, whilst others have a part-time visiting medical staff doing this part of the work. But in all cases the total number of the staff is below the standard known to be necessary for a first-class hospital, and far below the standard of the voluntary hospitals. If the municipal hospital of the future is to be a first-class hospital, then it must have its staff raised both in numbers and status. If it is to be definitely relegated to the position of a second-class hospital, then some process of selection of cases must be adopted by which such a large proportion of chronic or convalescent cases are sent to it as will justify its being staffed by a few resident administrative officers, with the addition of a few consultants.

The present position of the municipal hospitals may then be said to be one of rapid and vigorous growth supported by public funds, independent of philanthropy, certainly destined in point of number of beds to become the largest element of our hospital service; but at present it only provides a second-rate type of hospital, because of the inadequacy of the staff.

II.—*The Large Voluntary Hospitals.*

The second group, including those with medical schools, represents the main element in our hospital service. We are justly entitled to regard these hospitals with pride and affection, because they have been the cradle and nursery of all that is best in the tradition of English medicine. In fact so much has the vigour and growth of medical science been identified with the voluntary hospitals in this country that it is impossible to name a single great man in our profession who has done anything for the advancement of the science and art of medicine, who has not spent a large part of his working life in one of the voluntary hospitals. His discovery of truth has been made in that hospital, and his gift to humanity has been fashioned and brought to perfection in its precincts. And yet, in spite of this glorious tradition and the pride we have in our great teaching hospitals, the ruthless march of events has now come to jeopardise their very existence.

The voluntary hospital, the principal arena in which the fight between science and disease is taking place, the very laboratory of clinical research has to struggle for existence, its growth is stunted and its activities are crippled just because a proper adjustment has not yet been made between financial demand and supply. But the thing which is fundamentally wrong in the position of the voluntary hospitals is that maintenance by mendicancy and the independence of public control are retained as almost sacred principles—as ideals to be aimed at, instead of merely temporary expedients and conditions suitable to provide resting houses for sick poor, but utterly unfitted to provide the essential machinery of scientific medicine or the treatment of the bulk of the sick of a wealthy nation. But be the cause what it may, the fact remains that the voluntary hospitals, the backbone of our hospital system, are in a bad way. Growth and development are stunted, because income is ever being passed by expenditure, and the waiting-list of those seeking admission is steadily growing, or else such applicants are drifting off to municipal hospitals or country institutions.

III.—*The Third Hospital Group.*

This is perhaps the most difficult to criticise or discuss, because it contains units of such different sizes and such varied qualities. I think it is fairer to group the large voluntary hospitals, even if they have no teaching schools, but are staffed by consultants who do not engage in general practice with the second group. The category of a hospital is determined much more by the standing of its visiting staff than by the character of the building or the sources and amount of its income.

I would then define the smaller town hospitals and county hospitals as those staffed for the most part by men in general practice. Now I find it extraordinarily difficult to say what I believe to be true about these hospitals without overstating or distorting the truth. Many of these hospitals are well built and well situated, and their staff represents the best of well-qualified general practitioners, and yet there is something gravely wrong, and the work done is below the standard of what hospital work ought to be.

I know that these hospitals are responsible for turning out a great deal of bad surgical work, and I suspect that a similar statement might be truthfully made about their work in medical and special departments. This is really no reflection upon the character or the professional attainments of the staff. They are being asked to carry out an impossible task, that of being general practitioners and also specialists at the same time. To the mind of the public, and in the opinion of many who ought to know better, a doctor is a doctor and a hospital is a hospital. An isolated small town may in this respect be compared to a ship going to sea. Perhaps the little community consists of 500 to 1000 people, and it carries a ship's doctor and one or two nurses. It has a good pharmacy and may even have an operating theatre. But it is clearly understood by all concerned that this provision for medical attendance and treatment is only for meeting the simple ailments of every-day life, or for dealing with some exceptional emergency. If any grave illness or accident occurs the treatment of which permits delay, such treatment is postponed until the patient can be transferred to a suitable institution ashore. The fact that a medical man, fully qualified in medicine, surgery, and midwifery is on board does not lead anyone to expect that specialist treatment will be afforded to all or sundry whilst on the voyage.

A country district or a small town is provided by the munificence of a private donor or by collective subscriptions with a hospital of from 10 to 50 beds. The country doctor or the town doctor naturally welcome this as affording a place where cases of severe illness can be nursed and attended. But it must be obvious that neither scientific elaboration of diagnosis and treatment nor the provision of experienced specialists can be commanded by these institutions. But if scientific elaboration and experienced specialists are necessary to carry out the treatment of disease in the city, why are these not necessary in the country? It can hardly be suggested that country patients generally suffer from less obscure ailments or less severe accidents than are experienced by dwellers in the city. These small hospitals, which have multiplied greatly in recent years and especially since the war, are, of course, the products of the voluntary system, and embody many of its worst features. The foundation, endowment, and maintenance are all private gifts or the product of irresponsible mendicancy.

There is no authority which can either stop or control the setting up of a cottage hospital, neither when once it has been established is there any power, other than public opinion, by which its conduct can be regulated. Public-houses and music-halls cannot be established without authority or conducted without supervision, but hospitals, by our English tradition, would appear to require neither safeguard. This third group, the smaller voluntary hospitals, shows growth and development in size and numbers, but I would venture to submit that the growth is unhealthy, and requires the most careful consideration by the medical profession, who should be prepared to submit some plan by which the smaller hospitals might be graded and brought into organic union with the rest of our hospital service.

Fundamental Test of a Perfect System.

I have already indicated that the fundamental test of the voluntary system is not its capacity to provide so much money for so many beds. The question is rather—can it provide the best type of hospital service for the bulk of the community? My thesis is that it cannot, that the best type of hospital service and the voluntary principle are incompatible under modern conditions, and that so long as the maintenance of the voluntary system is made the first and greatest object of our hospital policy, then the attainment of a perfect hospital service must be abandoned or relegated to a second place in our programme. In setting out these terms of my thesis I have been in doubt whether to use the term voluntary or mendicant. I have chosen to adhere to the words voluntary system, because it is that in familiar use, and because I do not want to weary you by a constant reiteration of the unpleasant word "mendicant." But I would make it clear that as at present the voluntary system is essentially one which depends for its support on begging appeals, it is in its character as a mendicant system that I am criticising it throughout.

The voluntary system fails to provide a perfect hospital system for the following reasons. The hospital is founded and managed by laymen, whose main qualification for the work is their philanthropy and not their expert knowledge. So long as they pay their way and do not contravene the regulations of the Health Ministry there is no authority which can guide or control the work of a voluntary hospital. It is an independent unit in the social service, which does not coöperate with other institutions doing similar work. In every city voluntary hospitals have been founded independently of one another, and even in opposition to each other. Originally there may have even been a political or sectarian reason for this opposition, and, though this may have ceased or been forgotten, the rival institutions continue to compete with one another for public support. Expenditure is very carefully controlled in regard to the feeding and nursing of patients, but it is extravagant and wasteful in the multiplication of overhead charges, scientific equipment, and, worst of all, of specialists, involved by having two or three rival institutions instead of one. But quite apart from the financial extravagance involved in having several small hospitals, there is the inefficiency of multiplying special departments. Three hospitals of 200 beds existing in the same city each have an eye department and perhaps six beds allotted to each—and to each of these is attached an ophthalmic surgeon. The department at each hospital is not large enough for the ophthalmic surgeon to have an assistant, and the situation is, perhaps, saved from absurdity by the foundation of a special eye hospital in addition to the general hospitals, where there is a reasonable chance of an ophthalmic clinic justifying the existence and guaranteeing the efficiency of three ophthalmic surgeons in one town.

Research and the advancement of medical knowledge, which ought to be the very first reasons for a hospital's existence, have to be subordinated to the prime object of getting enough money to keep going as many beds as possible. For the moment I am not referring to laboratory work, but to the actual care and cure of patients. For research and advancement in this, careful records, statistics, and a "follow-up system" are absolutely necessary—but these are generally left for haphazard note-taking, or to individual efforts to trace case-histories. Compare for a moment the expense and personnel of the registrar's department of a hospital with that of a secretary, and you will admit my point.

If the work of a hospital is regarded as a business enterprise, the first object of which is to cure or relieve the greatest number of patients in the quickest and most satisfactory manner, then surely every business man would say that it is of the utmost importance to examine most closely every method used, and to note the immediate and the late results. An analysis of deaths with their causes, reports of different methods of treatment and their results would be matters of routine inquiry. Every new operation would be carefully followed up to see if it was justified by recoveries or condemned by disasters. Such routine research ought to be an essential part of the every-day work of the hospital, and will require a considerable staff of trained clerks, working under proper supervision.

(To be concluded.)

THE GUARDIANSHIP SOCIETY.

THE Guardianship Society, which arranges for the care and supervision of the mentally and physically defective, held its annual meeting at Brighton on April 12th. A further increase of work in all the departments of the society was recorded in the annual report, "a growth which year by year is a proof of its necessity, and no limit can be placed to its future possibilities." The report stated that unsolicited applications during the 12 months totalled 482, as against 461 in the previous year, the national interest of the society being emphasised by the fact that no fewer than 383 were from districts outside Sussex. A large number of patients were still on the waiting list. During the year the society had 943 persons under care, in addition to which 70 were visited in their own homes, exclusive of after-care patients. The mental after-care department formed to keep in contact with patients discharged from the mental hospitals was becoming increasingly important, 89 new cases being added during the year, bringing the total on the register to 314. The clinic for nervous disorders had completed four years of most valuable work. Since its inception 371 patients had been treated, and this early treatment, the report claimed, had undoubtedly been instrumental in saving many patients from being certified. The society has two cottage farms in Sussex, and the work of training defective lads at these occupational centres, the report said, was proving highly satisfactory. Dr. S. E. Gill, medical inspector to the Board of Control, said his colleagues and he were struck with the excellent work the society was doing; he looked forward to the time when every local authority would have a day training centre comparable to the institutions for the blind and the deaf and dumb, where defectives could go and receive their training while living at home. Other speakers included Dr. J. R. Kaye, formerly senior medical officer for the West Riding of Yorkshire, who gave a short address on the Multiplication of the Unfit.

THE USE OF RATTHANAT.

THE usual methods of rat destruction are not without disadvantages of one sort or another; drowning, ferretting, and shooting require elaborate preparation, and the use of poisons is attended with danger to domestic animals. The Bacteriological Institute of the Chamber of Agriculture of Berlin and Brandenburg has prepared a poison derived, it is stated, from "sea-onions," a popular name for *Scilla maritima* or squill. The poison is made up in cubes of bait attractive to rats, and has been given the proprietary name of Ratthanat. Even small quantities of the preparation when ingested by rats appear to cause death, with hæmorrhage into the intestine and enlargement of the spleen and kidneys. The dying rat seeks water and consequently often dies away from the premises on which the poison was taken. Domestic animals, it is claimed, are unaffected by the poison. Reports on the use of Ratthanat by the Institute for Hygiene, the Health Department of the City of Berlin, and the Prussian Institute of Hygiene are favourable; in each case test rats were used and received the preparation with other food; all the animals under experiment died in one, two, or three days, after a period of distress which usually terminated in coma and occasionally in convulsions. It is claimed that rats will attack the cubes even in the presence of other food and that one cube contains sufficient bait to kill six to eight rats. The poison usually has the effect of sterilising the intestine, thus helping to prevent offensive odours should the rat die in its hole. The bait can be obtained from Rat Exterminators, Ltd., Simpson House, Sheppy-place, Minories, London, E.C. 3.

MENTAL HEALTH.

THE National Council for Mental Hygiene and the Tavistock Clinic held a conference last year which is now reported in a useful book.[1] Lord Brentford, who presided at the inaugural meeting, emphasised the urgency of the problem of mental health by reminding his audience that in 1928 some 50,000 persons in this country came under observation for mental breakdown, and that 4871 committed suicide. Sir Maurice Craig showed the fallacy of the widely accepted idea that mental disturbance is a bolt from the blue; on the contrary, "it is commonly a slow and progressive failure in which the early stages are very frequently overlooked or misunderstood." Perhaps the best definition of mental ill-health was provided by Dr. H. P. Newsholme, who said that "broadly speaking, it implies failure of the individual to use his mental machinery with a degree of efficiency sufficient to maintain easy running for normal demands with a reserve of power for emergencies." Dr. A. Helen Boyle made a refreshing contribution in her plea that the most healthily minded child is the one with the greatest power of adaptability and judgment, so that a certain amount of irregularity in routine is a positive advantage. Dr. E. A. Hamilton-Pearson backed up this opinion by his counsel that, under right discipline, children should be allowed to buy their own experience, and by his warning that atrophy of mind, no less than of muscle, leads to disablement. The conference was divided into a number of sections, such varying aspects of mental health being discussed as sex education, juvenile courts, the personal equation in industry, mental hygiene in social and public work, the child and the parent, delinquency, and the problem child at home and in school. The general standard of the papers was at an unusually high level, and this unpretentious volume is a useful contribution by experts to a branch of medical study constantly growing in importance.

[1] Report of The Proceedings of the Conference on Mental Health held in the Central Hall, Westminster, London, Oct. 30th to Nov. 2nd, 1929. Edited by Dr. J. R. Lord. London: Adlard and Son, Ltd. 1930. Pp. 95. 2*s*.

CURRENT ENGLISH.

THE little Oxford Dictionary of Current English[1] measures 5¼ by 3½ by ¾ inch, and contains within this compass all the words which an educated person need know at the present time and far more than he can ever use. It would be difficult for anyone unacquainted with lexicography to estimate the skill and labour which have been put into this book. The final result may be compared with the neat and shining crystals of insulin obtained by evaporation, precipitation, and concentration of a mass of raw material by means of processes which it has taken a century to devise. The task of packing into 600 pages all that would go into them was entrusted to Mr. Ostler, who served for 44 years on the composing and reading staff of the Clarendon Press and whose encyclopædic knowledge has been at the service of two generations of compositors and authors. The dictionary is a guide to pronunciation as well as to choice of words; it warns the unwary that opus has a long o in the singular and a short one in the plural, and that midwifery is discreetly pronounced midifri. Current medical terms such as hormone, adrenalin, and vitamin are all there (the latter is given a short i); proprietary terms are marked with the letter p. The list of abbreviations will help the reader with most of the useful contractions, but we regret the omission of G.M.C. and C.M.B. Even with compression carried to its limit, it takes two lines to define a liar (being a person who utters an intentionally false statement) and three for a Bunsen burner. One is glad to note that custard must contain eggs and milk, and that bunkum may be spelt either phonetically or in accordance with its derivation. Stunt, dope, dole are given their modern significations. But to prolong this notice would be an injustice to so compendious a book.

[1] Compiled by George Ostler. Oxford, at the Clarendon Press. London: Humphrey Milford. 1930. Pp. 626. 2*s*.; on india paper, 2*s*. 6*d*.

Appointments.

BROWNE, JULIA M., M.B., B.Ch. N.U.I., D.P.H., has been appointed Medical Officer of Health, Stepney.

EASTWOOD, W. J., M.B., M.Ch. Liverp., Surgeon-in-charge of the Orthopædic Department, Royal Albert Edward Infirmary, Wigan.

POWELL, A. T. W., M.B., B.S. Lond., D.P.H., Medical Officer of Health, Walthamstow.

RAY, JOHN HOWSON, Ch.M. Manch., F.R.C.S. Eng., Honorary Consulting Surgeon to the Manchester Royal Infirmary.

SOUTHAM, A. H., M.D., M.Ch. Oxf., F.R.C.S. Eng., Honorary Assistant Surgeon, Manchester Royal Infirmary.

SWINDELLS, R. H., M.B., Ch.B. Manch., Medical Superintendent at New End Hospital, Hampstead.

UNGLEY, H. G., M.B., B.S. Durh., House Physician, Royal Victoria Infirmary, Newcastle.

Certifying Surgeons under the Factory and Workshop Acts: BROOKS, G. M., L.R.C.P. Lond., M.R.C.S. (Christchurch); JONES, A. M., L.R.C.P. Lond., M.R.C.S. (Llandudno); NICKSON, H. C., M.B., Ch.B. Birm. (Soham, Cambs); and SPARKS, C. W., L.R.C.P., M.R.C.S. (Matlock).

ROYAL NORTHERN HOSPITAL.—The 54,196 out-patients who were treated last year created such serious congestion that the enlargement and reconstruction of this department are a pressing need. There were 5752 in-patients who cost £3 17*s*. 8½*d*. each per week. The X ray department treated 9442 cases, and a training school for radiographers has been established. Investigation of the treatment of certain forms of cancer by means of activated fluorescein are stated to have had such satisfactory results that arrangements have been made at the request of the Cancer Committee of the Ministry of Health for the continuance of the treatment and for further research.